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FIRST SESSION, FORTY-THIRD CONGRESS.

EXECUTIVE DOCUMENTS

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Volume 2....No. 1, part 2, War, parts 1, 2, and 3.
Volume 3....No. 1, parts 3 and 4, Navy and Postmaster.
Volume 4....No. 1, part 5, Interior, parts 1 and 2.
Volume 5....No. 1, part 6, and No. 2.
Volume 6....Nos. 3 and 4.
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Volume 9....No. 58 to No. 122, inclusive.
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Volume 13....No. 143, Commercial Relations.
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TO

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OF THE

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REPORT

OF THE

SECRETARY OF THE NAVY,

BEING PART OF

THE MESSAGE AND DOCUMENTS

COMMUNICATED TO THE

TWO HOUSES OF CONGRESS

AT THE

BEGINNING OF THE FIRST SESSION OF THE FORTY-THIRD CONGRESS.

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REPORT

OF

THE SECRETARY OF THE NAVY.

NAVY DEPARTMENT,
Washington, November 29, 1873.

SIR: The following report of the Navy Department and the naval service for the past year is respectfully submitted:

There are now in the Navy 165 vessels, carrying, exclusive of howitzers, 1,269 guns, which is a reduction, since my last annual report, by sale and otherwise, of 13 vessels. A general enumeration of these vessels presents: 63 steamers, other than iron-clads and tugs, carrying 826 guns; 29 sailing-vessels, 322 guns; 48 iron-clad vessels, 121 guns; and 25 tugs, used for navy-yard and freight purposes. Of this number there are at present in commission for sea-service, distributed on the several foreign stations and on our own coast, 46 vessels, carrying 407 guns. The cruising or active force of the Navy, as these may be called, and which is controlled by the appropriations made and the seamen authorized by law, is about the same as last year, the places of those vessels which have been put out of commission within the past twelve months, from expiration of the cruises or for other causes, having been supplied by commissioning and sending to sea a corresponding number of others.

The list will show a force slightly decreased in numbers by the sale of some useless vessels, which were, while we retained them, only a source of expense, and it is somewhat weakened also in strength by the condemnation and laying up of several of our white-oak cruisers which have reached the limit of their cruising-life and can no longer be used with safety on the seas.

Many of the ships now on the Navy list, and which serve to swell the number to the figures above given, are far from being such as are really needed, and their true condition, which has been often officially represented to Congress, can be fully understood and appreciated by reference to the reports of the Bureaus which are herewith submitted.

In the meanwhile, however, we have been engaged in completely repairing six of our live-oak cruising-ships, which are now in various stages of forwardness at the several navy-yards. These are all of moderate size, and none of them sufficiently advanced to be of present use, but they are adapted to the wants of our cruising Navy, and will in a few months add materially to its strength and efficiency.

The eight new sloops of war authorized by the last Congress are all in process of building—one-half at the various navy-yards, three under contract in private yards, and the remaining one under private contract in the navy-yard at Kittery. The building of these ships, with their engines and machinery, is progressing rapidly, and the work, widely distributed at more than a dozen naval stations and private establishments, is contributing to the remunerative employment of several thousands of workmen, and to the maintenance of the very large number of persons dependent upon their labor for support and education. It is not without gratification that I am able to report that, besides the great value and importance of this work to the service, we have also been able so to utilize the liberality of Congress, as to contribute materially to the business interests of the country and to the support and comfort of many producing and dependent people.

The valuable work thus begun should not be discontinued, but the Department should be provided with a moderate amount of funds and authorized to commence each year to build a certain number of tons, to supply regularly the regular yearly expenditure of naval force which will of necessity occur.

IRON-CLADS.

The work of putting our iron-clad force in efficient condition, referred to in my last report, has been proceeded with as fast as the means necessary for the extraordinary work could be spared from the current appropriations for the support of the Navy. The wisdom of this action needs no illustration from me at this time; without it we would have been left not only powerless to assert our own rights, but almost defenseless against arrogance or aggression; but the expenditure required has crippled our working Bureaus in their general work, and it is necessary that this should be re-imbursed to them if they are to proceed steadily and efficiently.

CRUISING STATIONS.

The stations have been unchanged during the year. As now established, they are designated as the European, the Asiatic, the North Atlantic, the South Atlantic, the North Pacific, and the South Pacific. Over these, embracing the frequented waters of the globe, are scattered a cruising force of less than forty vessels, which by their presence are relied on to encourage our citizens, and, if required, to protect them and their property in all lands to which by their inclination or interests they are drawn.

THE EUROPEAN STATION.—Rear-Admiral A. Ludlow Case commands the naval force on the European station, having succeeded Rear-Admiral James Alden at Villefranche June 2, when the latter transferred his flag from the Wabash to the Brooklyn and returned home, arriving at New York July 10.

The vessels have been actively cruising during the year, and have visited ports of Great Britain, Holland, Germany, France, Portugal, Spain, Italy, Austria, Greece, Turkey, Syria, Egypt, Tunis, Tripoli, Algiers, and Africa, the islands of the Mediterranean, &c.

The disturbances in Spain which called a part of this force to that coast in July last have continued to require the presence of two or three vessels, which have given particular attention to the ports where there were American citizens and interests. They have been under instructions to give full protection to such, and to carefully abstain from interfering in any way with the affairs of the country or its people, except for the protection of our citizens and their property. The position of our commanding officers in that quarter has at times been extremely delicate, requiring the exercise of sound discretion and intelligent action.

In the appendix which accompanies this report will be found a summary of the movements of the vessels on this station and on the others.

THE ASIATIC STATION.—Rear-Admiral Thornton A. Jenkins, who was at the date of the last report, and is still, in command of the force on this station, will soon be relieved by Rear-Admiral E. G. Parrott, who sailed in the mail-steamer of the 1st of November from San Francisco.

Undisturbed friendly relations between our country and the great empires of the East have made the duties and services of our officers and vessels on the Asiatic station peaceful and agreeable. At the same time an increasing commerce, the opening of new avenues of trade, the surveying of uncertain and intricate channels, and the determining and fixing of dangers to navigation have afforded them useful employment, and given an importance and interest to the station surpassed by no other. The vessels have repeatedly visited the ports of China and Japan, penetrated their rivers as far as treaty stipulation and navigation would permit, and with scarcely an exception were received everywhere with good feeling. They have also extended their visits to Singapore, Bankok, Calcutta, and Manila.

The Colorado arrived at New York in March, and the Alaska in February, from this station, and their places were taken by the Hartford and Yantic.

THE NORTH ATLANTIC STATION.—Rear-Admiral G. H. Scott, who is at present in command of the force on the North Atlantic station, relieved Rear-Admiral Joseph F. Green at Key West, May 15, and the latter returned to Boston in the Powhatan, arriving May 27, and hauled down his flag.

The force on this station was reduced in the spring and summer by ordering north, as a necessity, some of the vessels, which were much in need of repairs and whose crews needed a change, having been long in the tropics. The Shawmut and Nipsic, two of the smaller but active class of vessels, came north in June, and the Richmond was about the same time, transferred to the North Pacific station. The Kansas was

until July co-operating with the Nicaragua surveying expedition, but, at the same time, her repeated visits to Aspinwall enabled her to give full protection to our interests in that quarter.

Notwithstanding this reduction, important and useful cruises have been made, and our flag has been shown at almost all the commercial ports, or where there were American interests, in the Gulf and on the Caribbean Sea; many of them have been visited repeatedly, viz: St. Thomas, Santa Barbara, San Domingo, Port au Prince, Jacquemel, St. Nicholas Mole, Cape Haytien, Gonaives, Aux Cayes, San Juan, (Porto Rico,) Gaudeloupe, St. Pierre, La Guayra, Puerto Cabello, Curaçoa, Santa Martha, Carthagena, Aspinwall, Greytown, Vera Cruz, Kingston, Havana, Matanzas, Nuevitas, Santiago de Cuba, Guantanamo, and Bermuda.

Assistance has been offered, and extended when required, to our commerce and citizens, the commanding officers have been in constant communication with our ministers and consular representatives, our interests on the Isthmus have been watched, and a vessel, almost constantly stationed on either side, has been in readiness to protect the railroad if occasion should demand. Convoy has been afforded to the merchant service when menaced and threatened with unlawful seizure and violence.

In addition to these appropriate and legitimate duties of our ships of war on the North Atlantic station, they have been engaged, as occasion permitted, in important hydrographic surveys both on our own and neighboring coasts, securing important data for the benefit of commerce, and have aided, to a limited extent, submarine telegraphic enterprise.

THE SOUTH ATLANTIC STATION.—The force on this station is under the command of Rear-Admiral James H. Strong, who took passage in the steamer of September 23 from New York, and relieved Rear-Admiral William R. Taylor at Rio de Janeiro, October 24, hoisting his flag on the Lancaster. Rear-Admiral Taylor is returning home by mail-steamer.

Nothing has transpired to require an increase of the force on this station, which is now, and has been for several years past, at the lowest possible figure.

The Monongahela, which sailed from Newport on November 12, has taken the place of the Ticonderoga, which has already started for home. The vessels on this station, few in number, have been sufficient for all purposes, as the relations between our country and the countries with which the command has intercourse have been pleasant and friendly; and ample security has been extended by the authorities to American citizens engaged in commercial pursuits or sojourning in that quarter.

The usual cruising has been carried out, and the ports of commerce on the coast visited by the larger vessels on the station, while the Wasp has ascended the navigable streams of Uruguay and Paraguay, facilitating the movements of our diplomatic representatives and encouraging American residents in the interior.

Merchantmen in distress, whether of our own or other nationality, have received every assistance in the power of our vessels to afford; and it has been their good fortune to relieve several during the year. While not engaged in other more important business, the time has been usefully improved by contributing valuable hydrographic results by surveys conducted under instructions from the Bureau of Navigation.

THE NORTH PACIFIC STATION.—Rear-Admiral A. M. Pennock commands the naval force on the North Pacific station, with the Saranac as his flag-ship and San Francisco as his headquarters. His flag was transferred from the California June 28, and the latter vessel was put out of commission.

The movements of the vessels on this station have, during the year, extended to the Sandwich Islands, our possessions on the northwest coast, and the coast of Mexico and Central America.

The death of His Majesty the King of the Sandwich Islands, information of which was received late in December, and the changes which would naturally follow so important an event, suggested the propriety of the admiral visiting Honolulu, and he proceeded to that port at once, arriving January 15. . In the mean time a new King had been chosen, a new ministry selected, and the government in the course of harmonious action. The Hawaiian flag was promptly saluted, and a gratifying exchange of visits and courtesies immediately followed. Later, His Majesty visited the California, and upon the invitation of the admiral availed himself of the opportunity of visiting some of the islands of his dominion by a passage in the Benicia, which was temporarily made the flag-ship of the station. Rear-Admiral Pennock returned to San Francisco in May, and in July proceeded on a northern cruise. Victoria, Esquimault, Sitka, Port Townsend, Olympia, Seattle, and Steilacoom were visited, as well as some other places of less importance.

Interviews were held with the Indians of Alaska, many of the chiefs of which visited the ship, and the occasion was availed of to impress them with the importance of maintaining the friendship of our people; and also to reconcile differences which had long existed between the principal tribes, which they were anxious to settle. The flag-ship returned to San Francisco September 29, and on the 7th of October following proceeded to the Sandwich Islands.

Other vessels of this command have shown the flag at ports in Costa Rica, Nicaragua, San Salvador, Guatemala, Honduras, Mexico, and Colombia, at all of which our commercial relations were undisturbed and the feeling of the officials and citizens represented to be of the most friendly character.

THE SOUTH PACIFIC STATION.—Rear-Admiral John J. Almy succeeded Rear-Admiral Charles Steedman in the command of the naval force on the South Pacific station, at Panama, September 22, hoisting his flag on the Pensacola.

This station includes the islands and waters of the Pacific south of the

equator, as far west as the one hundred and fiftieth meridian, and the coasts and sea-ports of Australia; but in consequence of the disturbed condition of the State of Panama, where there have been serious outbreaks, and the prosecution of important hydrographic surveys, the visiting of these distant quarters has been omitted during the year.

Within the limits of this station only two occasions have arisen where it has been necessary to land a force from our vessels for the protection of American citizens and property, and on each of those occasions the landings were made on the same territory, at the request or with the permission of the authorities, or under an admission, on their part, of their inability to promise the security and protection due from them.

Rear-Admiral Steedman, on arriving at Panama, May 7, found hostilities in progress between the opposing parties contending for possession of the government of the State of Panama, and, at the request of the United States consul and a number of influential American and other foreign citizens, sent on shore a force of two hundred sailors and marines, with four pieces of artillery, which were equally divided between the city and the railroad-station. This force was landed from the Tuscarora, which had prepared for responding to the signal for protection the evening before the arrival of Rear-Admiral Steedman, and from the flag-ship Pensacola. It was withdrawn from the city on the 11th, and from the depot on the 22d May, all differences having been settled.

The second landing was made September 24, under the order of Rear-Admiral Almy, the revolutionary movements having been renewed. A force of one hundred and thirty men, well armed and equipped, with howitzers, was stationed at the depot, and it was afterward increased to one hundred and ninety men, and detachments posted to protect the American consulate, and other American houses and American property. The authorities on this occasion gave notice of their inability to give the protection guaranteed by treaty. The landing parties were from the Pensacola and Benicia, the latter vessel belonging to the North Pacific station. Hostilities ceased October 8, and the force was withdrawn, excepting a detachment of thirty men, which was left a few days longer to guard the depot and the railroad should the troubles revive.

The landing of these detachments during the two emergencies, while quieting the fears of foreign residents, secured the safe transit of the passengers and their effects, and of the freight and specie of four lines of steamers, two of which were not of our nationality, depending on this road for prompt transportation.

The officers and men who composed the landing parties received the commendation of their respective commanders-in-chief for the creditable and admirable manner in which they discharged their duty. The commercial ports on the west coast of South America have been visited by the vessels of the South Pacific station, and some of them by vessels en route to the North Pacific station. With the exceptions above mentioned their proceedings have not been different from those common to

our cruisers frequenting the waters of friendly nations; and the exchange of courtesies between our officers and the authorities and other residents appears to have been mutually gratifying.

MISCELLANEOUS.

In addition to the vessels which have constituted the regular force of the several stations, others have been usefully employed on special or separate service.

The Portsmouth has been engaged in surveying reported dangers and islands in the Pacific, on the highways of commerce, the existence or position of which has not been clearly established or definitely fixed. The Narragansett has been examining the route pursued by our merchant steamers along the Californian and Mexican coasts, for the promotion of safer navigation. The Tuscarora has conducted a series of soundings along and off the northwest coast, to determine a suitable bed for a submarine telegraph-cable between the United States and Asia; the Michigan has cruised on the lakes for the assistance of the merchant marine, or for any other emergency; the Juniata has visited the Greenland coast in search of the Polaris; the Blue Light has been at the disposal of the United States Commissioner of Fish and Fisheries on the coast of Maine; the Guard and Supply have carried out the articles of American exhibitors to the Vienna exposition; and the Constellation and Fortune have made the usual summer cruise with the cadet midshipmen and cadet engineers respectively.

In addition to the regular service, we still supply from the number authorized by law for the Navy the men and officers for the Coast Survey, and officers for light-house duty.

We have also completed, during the past year, two further surveys of the great Isthmus, and have made constant and extensive ocean soundings and surveys in the interest of science and commerce.

INTEROCEANIC CANAL.

The expeditions organized under the authority of Congress for the survey of the Darien and Nicaragua routes, with the view to the construction of an interoceanic canal, have completed the duties intrusted to them, and the reports of Commander Thomas O. Selfridge and Commander E. P. Lull, who respectively conducted the surveys, are herewith submitted.

The return of these expeditions, with full reports of their results, seems to leave little more to be done in the direction of isthmus surveys; and in the now completed explorations, most creditable to all engaged in them, the Department feels assured that the resolutions of Congress which led to the same have been carried out in the spirit in which they were conceived.

The results of these two last surveys may be summed up as follows:

DARIEN SURVEY.—The favorable report of Commander Selfridge of

the survey of the Isthmus of Darien, in 1871, rendered it desirable to explore more thoroughly the region of the Napipi, and to definitely settle how far the surveys to the south could be profitably carried on in the valley of the Atrato.

Commander Selfridge was accordingly ordered to organize another expedition, which arrived in Panama in January last. The Tuscarora, Commander Belknap, of the Pacific fleet, was ordered to co-operate with it, and form a base for the desired surveys.

It is very gratifying that the expedition has been so successful as to materially improve upon the route already discovered and surveyed, and has marked out a line for this great enterprise that can be constructed within the limit of an expenditure more moderate than could have been expected, when compared with the immensity of the undertaking, and the great benefits that cannot fail, upon its completion, to occur to our commercial interests.

Briefly stated, the route selected by Commander Selfridge includes one hundred miles of river navigation of the Atrato, which has been carefully sounded, and found to be fully capable of being navigated by the largest class of ocean-steamers. Between Atrato and the Pacific a canal or artificial cut is made but twenty-eight miles in length. The canal for twenty-two miles of this distance passes through a plain, with a gradual rise of 90 feet. There will then remain six miles to the Pacific, of which there are a moderate open cut and three miles of tunneling. It is estimated that the work will cost between $50,000,000 and $60,000,000, and that it can be completed within ten years.

A careful survey and soundings of the Atrato resulted in the fact that, though capable of navigation for steamboats, even in its lowest stage, to Quibeto, the head of ship-navigation was reached but a short distance above the line selected for the canal.

Surveys of the interior settled the fact that it would not be profitable to explore south of the Napipi; not only because the westerly trend of the coast made the area that would have to be canalized broader in extent, but also that it was traversed by numerous streams, forming the water-shed of mountainous ridges that would have to be cut transversely. Moreover, the Cordilleras, which present a marked depression near the head-waters of the Napipi, increase rapidly in altitude as you proceed south.

The health of the expedition has been as satisfactory as the preceding ones.

These surveys, which include the whole Isthmus of Darien, have not resulted in the loss of a single life through climatic causes. Much of this immunity from disease in a sickly climate and an arduous duty is due to the provident care and well-laid plans of the officers in command.

NICARAGUA SURVEY.—The Nicaragua surveying expedition, in charge of Commander E. P. Lull, sailed from the United States in December, 1872, and returned in July last. The results of its labors prove the existence of a practicable route for an interoceanic ship-canal, having

Lake Nicaragua at its summit level. It is proposed to connect the lake with the Pacific by a canal 16.33 miles in length, beginning at the mouth of the Rio del Medio, and terminating at Brito. The first 7.50 miles will require an excavation averaging 54 feet in depth, and will be the most expensive part of the whole work. The profile for the rest of the distance is lower than the proposed level of the surface of the water; embankments will be built up with the material excavated. Ten locks and one tide-lock will be required between the lake and the sea. There will be fifty-six miles of lake navigation; 26 feet of water can be carried within 1,350 feet of the mouth of the Rio del Medio. On the east side a channel will have to be deepened, from 6 to 8 feet, for nine miles. The bottom is a firm mud without a single rock.

Slack-water navigation in the San Juan, from its head to the mouth of the San Carlos, is considered perfectly feasible; and it is proposed to improve the river by four dams, one each at Castillo Rapids, Balas Rapids, Machuca Rapids, and at the mouth of the San Carlos, at all of which places excellent locations for dams exist. A short section of canal with one lock will be required to get around each of the upper three dams. From just above the fourth dam to Greytown an independent canal will be required, 41.90 miles in length, of which thirty-six miles will require an excavation less than the prism of the canal; the remaining four miles are made up of short reaches, where the line cuts through hills. Seven locks, besides those abreast the dams, will be required, and should be located in the hills in order to take advantage of the natural rock foundation. Some improvement will be required in places in the river-bed, for which the amount has been computed and the cost estimated.

The total length of the proposed canal is 61.74 miles, of which 47.37 miles are in excavation and embankment. The average depth of excavation throughout is but 9 feet above the prism of the canal. No tunnel is required. The harbor of Greytown has been partially destroyed by a silt which comes from the San Carlos, and others of the lower tributaries of the San Juan, and the branch of the river leading to Greytown has become so much filled up that it is now, at the lowest stage of the water, but 324 feet wide and 6 inches deep at the fork. It is proposed to shut off this branch entirely and send all the silt-bearing water through the Colorado mouth, which empties into the sea eighteen miles from Greytown, and to admit to the harbor only the water of the canal, which being drawn from the main river above the mouth of the San Carlos will be perfectly clean. The harbor then once cleared out, will leave nothing to deteriorate it again.

A short breakwater will be required to protect the entrance from the surf, also one at Brito, both of which are included in the estimate for the work.

Careful gauges at the lowest stage show that Lake Nicaragua will supply thirty-eight times the maximum possible demand of water.

The climate is considered perfectly healthy for temperate people who adopt the simplest sanitary precautions. Part proof of this is that not a man has been lost in either of the expeditions lately operating in the country, though constantly subjected to severe labor and exposure.

THE POLARIS.

In my annual report of November 25, 1871, I communicated the latest information then known of the proceedings of the expedition toward the north pole, in mentioning the departure of the Polaris from Upernavik, Greenland, on the 18th August, 1871.

From that time no tidings from the Polaris were received until the 9th of May, 1873, when, by a telegraphic dispatch, the consul of the United States at Saint John's, Newfoundland, apprised the Department of State that nineteen persons, late of the Polaris, had been rescued from the floating ice in Baffin's Bay, by the British sealing-steamer the Tigress, and that they had safely arrived at that port.

The Department dispatched the United States steamer Frolic from New York to Saint John's to receive these persons and to bring them to Washington. The Frolic accomplished this mission without delay, and on the 5th of June arrived at the navy-yard, having on board two of the officers, eight of the crew, and nine Esquimaux, five of whom were children, all in good health.

For the reasons stated in my report to you of the 17th of June last, I deemed it advisable that I should hold an examination of these persons, and, accordingly, with my associates named in that report, such examination was carefully made, and the result communicated to you in our joint report of June 16. Both of these reports and the testimony of the witnesses, with the diaries of several of them, are published in the appendix to this report, and present a most interesting history of the voyage and discoveries of the Polaris up to the time of their accidental separation from these hardy mariners on the night of October 15, 1872, and of their own subsequent sufferings and adventures during the one hundred and eighty-seven dreary days of their drift among the ice.

Of the Polaris herself nothing more was known until September 19, 1873, when the arrival of the British sealing-steamer Arctic, at Dundee, Scotland, with six of the officers and three of her crew on board, was telegraphed to the Department of State by the United States consul at that port, with the further information that the remaining officer and the other two seamen would soon follow; all hands of the Polaris having been picked up by the British whaling-steamer Ravenscraig on the 23d of June, south of Cape York, off the Greenland coast, while on their way in boats to the southward, the Polaris having been abandoned as a wreck.

As mentioned in my report to you of the 16th of June last, the Juniata, under Commander Braine, and the Tigress, under Commander Greer, were dispatched from New York as soon as they could be pre-

pared for such service to search for the Polaris, and this duty was promptly and faithfully performed; but, happily, the British whaling-ships were on their cruising-ground early enough to rescue the whole party almost as soon as their boats rounded Cape York.

From the captain, officers, and crew of the Ravenscraig, Arctic, and Intrepid, all British sealing-steamers, these survivors of the Polaris received the kindest and most hospitable welcome and the most generous treatment, and I take great pleasure in recommending that a suitable acknowledgment be made to them for their humane and generous conduct.

On the arrival in this country of these nine persons, they also were brought to Washington and examined by myself and the same associates as on the former occasion. Awaiting the return of the three remaining persons, this investigation has not been completed as yet, and the report is withheld until an opportunity offers to do so, when it will be submitted and printed.

To these reports, to the narrative of the expedition which will be prepared in due time for publication, to the scientific history of the results obtained in that department, and to the map in course of construction, I must leave the full development of all matters connected with this most interesting voyage toward the northern pole, made under the flag of the United States.

I may, however, state in general terms that the cruise of the Polaris has been decidedly the most successful of arctic expeditions. The geographical knowledge of the arctic regions has been largely advanced. The ship herself, in two months after her departure from New York, attained the latitude of 82° 16′ north, a position far beyond the limits of all previous navigation toward the pole, and the exploration of Captain Hall and of the officers, and of the scientific gentlemen upon the land, have all that singular interest which accompanies the examination of regions heretofore unknown to civilized man.

The only death which occurred during the expedition, from first to last, was that of its commander, Capt. Charles F. Hall.

A very particular questioning of every one of the officers and crew of the Polaris and of the scientific corps (except the three persons as yet unexamined) has completely satisfied my associates and myself that his death occurred from purely natural causes; that his medical treatment was judiciously adapted to his case, and that he was tenderly nursed and cared for to the last.

The evidence has also made it manifest that Captain Hall was always faithful to the trust reposed in him in assigning him to the command of the expedition; that he was kind, firm, and humane in the exercise of his authority; that he was earnest in his desire and in his attempts to reach a high northern latitude, and if practicable, the pole itself, and that his untimely death was an irreparable loss to the expedition.

It is also apparent that Captain Buddington, who succeeded to the

chief command on the death of Captain Hall, proved himself to be a good seaman, and that in all the dangerous positions in which the Polaris was placed, his conduct as her commander, was skillful and judicious, the natural result of a good judgment and of long experience at sea and in command in northern latitudes.

The domestic history of the expedition, as developed by investigations, was, on the whole, as harmonious as might have been expected. Obedience was maintained, and good order was generally preserved on board.

The ship herself proved to be exceedingly strong, and capable of resisting a very heavy pressure of ice. Had she been of less strength she would have been crushed and wrecked on occasions prior to October 15, 1872. The testimony is clear and unanimous on this subject, and is also conclusive on another vital point, that she was well found in provisions and stores for an arctic voyage. Her steam-machinery worked satisfactorily, and was in good order when she was run aground, on the 16th October, 1872, the day after she broke adrift from the ice-floe.

The injuries she received on the night of the 15th October, in addition to former hurts, proved fatal, and she was with great difficulty kept afloat until she could be beached on the next afternoon. During that day, notwithstanding that a lookout was kept for the missing people upon the ice, nothing was seen of them from the ship; and if they had been seen she could not have gone to their rescue.

The Polaris was beached in a sinking condition, at Life-boat Cove, near Littleton Island, in latitude 78° 23′, a place visited by Kane and Hayes, in former years.

Friendly Esquimaux soon made their appearance with dogs and sleds and aided greatly in transporting stores from the ship to the shore, and kindly relations were kept up with these people to the last.

Constructing a house out of material supplied by the Polaris, the winter and spring were passed in comparative comfort. When the sun appeared in February the building of the boats, from the planks of the Polaris, was begun, and they were completed in time for the whole party to embark in them, with all of the records and specimens they could carry, as soon as the state of the ice would permit.

On the 3d of June last they abandoned their house, leaving nothing in it of any value whatever, and after an adventurous, but not very dangerous, voyage of 20 days, were picked up by the Ravenscrag, as before stated.

SEARCH FOR THE POLARIS.

The rescue of a portion of the officers and crew of the Polaris, and their return to St. John's, N. F., by the Tigress, a whaler of the Arctic Seas, and through whom intelligence of the disaster to the Polar expedition and of the death of its lamented commander was received,

gave hope that, although perilously situated, the remainder of the officers and crew, and the vessel itself, might, by prompt measures, be restored to their friends and country. As soon, therefore, as all necessary facts and information could be obtained, steps were taken to send out immediately an expedition to search for the vessel and party. The Tigress, which was well suited for such a purpose, far more so than any vessel we possessed, was procured for this service, brought to New York, and equipped, officered, and manned as soon as possible. At the same time the Juniata was made ready to proceed to the coast of Greenland and facilitate the movements of the Tigress, by carrying coal and other supplies, for which the latter had not sufficient capacity, and prosecute the search herself as far as was prudent for a vessel not built or strengthened for arctic navigation. Commander D. L. Braine was in command of the Juniata, and Commander James A. Greer was assigned to the command of the Tigress.

The orders to the Tigress were to make her way, if necessary, by every means possible and in the face of every danger, to the spot where the Polaris was last seen; those to the Juniata, which vessel was not so well fitted to encounter the ice, were to advance no farther in that direction than she could do without incurring more than ordinary risk and danger, and to aid in every possible way the special object of the Tigress. The orders in each case were promptly and ably executed, and on this hazardous and laborious service the officers and men exhibited commendable zeal and energy. The movements and proceedings of the vessels and commanders were as follows:

The Juniata, Commander D. L. Braine commanding, which sailed from New York June 24 for the arctic regions in search of the Polaris, returned to that port October 24. Some necessary changes were made in her condition, such as the reduction of her armament and complement of men, the sheathing of her bows, &c., to increase her carrying capacity and strengthen her to contend against the ice. She was coaled to the utmost to supply the Tigress and meet her own consumption, and after rather a hazardous passage, amidst fogs and icebergs, reached Fiskenaes, Greenland, July 14, having touched on the way at St. John's, N. F. She continued her voyage along the coast to the northward, stopping at Sukkertoppen and Holsteinborg, at which latter place the necessary dogs, skins, &c., for the use of the officers and men of the Tigress were procured, and reached Godhavn, island of Disco, July 21. Leaving there July 29, she pushed on through innumerable icebergs and rocks, and arrived at Upernavik July 31, at which port the governor stated that within his recollection of over thirty-five years no vessel of half the size of the Juniata had ever been.

From this place the steam-launch Little Juniata, under command of Lieutenant-Commanding Geo. W. De Long, with other officers and men, all volunteers for the occasion, equipped with sixty days' provisions and fifteen days' coal, sailed August 2 for Cape York, in search of the Polaris

and her crew, performing one of the most extraordinary voyages on record, and returning August 12. Off Tessiusak she communicated with the Tigress. August 13 the Juniata left Upernavik and proceeded south to Godhavn to meet the Tigress, which had been previously supplied and coaled. The time here waiting the arrival of the Tigress, or news from her, was profitably spent in searching for coal. The whaleboat and the launch were employed in this service, under competent officers, and several veins of coal of a bituminous nature were found running longitudinally through the mountains in latitude 69° 45′ north, longitude 52° 20′, from which supplies were procured. The Tigress arrived at Godhavn August 25; was again coaled; and on the 31st August the Juniata sailed for St. John's, N. F. Here she prepared for a renewed search for the officers and crew of the Polaris, and sailed again for the arctic regions September 18. The same evening telegraphic intelligence, received by the United States consul at St. John's, Mr. T. M. Mulloy, from Dundee, reported the arrival of the Polaris party at the last-named port, and with great promptness and discretion he immediately chartered a steamer, overtook the Juniata, and she returned to St. John's. She awaited the arrival at that port of the Tigress, October 17, and then returned to New York as above stated.

The Tigress sailed from New York July 14, touched at St. John's, and arrived at Godhavn August 6. She coaled and left August 8, and reached Upernavik August 10. She there received from the Juniata skins, coal, &c., and proceeded northward the following day, communicated with the Juniata's launch off Cape York, skirted the shore as closely as navigation would permit, examined North Star Bay, Northumberland Island, Hartstene Bay, without success, and August 14, one month after leaving New York, discovered at Littleton Island the camp which the Polaris people had occupied the previous winter. From the natives then in possession of it, information was obtained of the departure in June, all in good health, of Captain Buddington and party southward in boats constructed from the ill-fated Polaris, which subsequently sunk. Such papers, instruments, &c., as were found in the camp, and were of any consequence or value, were secured by Commander Greer, and the next day the Tigress stood toward the south. She passed Cape York, anchored in Melville Bay, communicated with the authorities at Tessiusak, and arrived at Godhavn August 25. She was again coaled by the Juniata, and immediately resumed the search. She ran over to the west coast, thence southward to the entrance of Cumberland Sound, back to the coast of Greenland, in the vicinity of Ivigtut and Fiskenaes, searched in Davis Strait as long as her coal lasted, and then proceeded to St. John's, at which port she arrived October 16, and learned of the rescue and arrival in Scotland of Captain Buddington and party. She left St. John's October 30 and reached New York November 9.

The Department takes this occasion to express its indebtedness to

the officials of the Danish government in Greenland for their uniform courtesy to the officers of the United States Navy connected with the recent expeditions to the Polar Seas, and for the facilities extended to those expeditions to promote their success.

TRANSIT OF VENUS.

The liberal appropriations made by Congress for making observations on the transit of Venus have been in part expended for the purchase of instruments. Five points will be occupied in the southern and three in the northern hemisphere. These observations are of so much scientific importance that it is my intention, under any eventuality now considered, to furnish naval transportation to the several parties designated, and such other facilities as may be practicable.

HYDROGRAPHIC OFFICE.

This office is steadily and surely progressing in its usefulness in the interests of navigation; as its issues of charts and books increase they are gradually taking the place of foreign publications, and some of its works are now much sought for abroad. The Pacific survey, originated in this office, under the Bureau of Navigation, will, as executed, be a great benefit, not only to the commerce of the United States, but to that of the world, and secondary to the survey, much information will be acquired in the various branches of natural science. The establishment, by electric telegraph, of the longitudes of the islands of the West Indies and the points on the northern coast of South America to which the cable has been laid by a party organized and instructed at this office, will make a most desirable addition to geographical knowledge and to navigation. I refer you to the report of the hydrographer to the Chief of the Bureau of Navigation, and recommend that two additional small vessels be employed in surveys, one in the West Indies, the other in Asiatic waters; in this we not only take, in common with other maritime nations, a part in the exploration of the channels of commerce, but give at the same time practical experience to the junior officers of the Navy in a most important branch of their profession.

Again I would call your attention to my recommendations in my previous reports, and I urgently recommend that an appropriation be made for the purchase and fitting a building permanent and suitable for the Hydrographic Office. I do not consider the rented building, at present occupied, as either suitable or safe in its present condition.

NAVY-YARDS.

I beg to renew the recommendations made in my annual reports of former years, in reference to our navy-yards, and to urge that their resources may be increased and developed to meet the emergencies of those wars to which even the most peace-loving nations are liable, and

which are best averted by a readiness for action should they be thrust upon us.

At the most of our navy-yards little could be done during the past year beyond making the repairs necessary to keep them from falling to decay.

At Mare Island, our only naval establishment on the Pacific, the new dry-dock, and the iron-working shop for construction, are well in hand and will add largely to its resources. We have great naval interests on the Pacific, and I cannot too strongly express the hope that Congress may strengthen them by liberal appropriations to develop this admirably placed arsenal.

League Island.—At League Island, in obedience to the injunction of Congress, the work of removing to it the material and stores of the old Philadelphia navy-yard has begun. The heavy ordnance, shot, and cannon, the anchors and chain-cables, and a portion of the ship-building timber are already transferred. A massive machine-shop and storehouse for yards and docks has been built, and the foundation of a still greater establishment for construction has been begun. It is conclusively determined that there is no difficulty in finding a perfectly secure foundation at moderate cost, and that such a foundation at League Island will be no more costly than at New York or Norfolk, or other of our sea-board navy-yards. It is time that we should cease to have two navy-yards at Philadelphia, and that the narrow and cramped yard so much needed by the city for its commerce should be transferred to the grand and better site bestowed by Philadelphia, and accepted by Congress with its implied obligations. I beg to renew my recommendation that Congress may cause the old navy-yard to be valued, and that it advance the sum expected to accrue from its sale, instructing the Navy Department to expend the amount thus appropriated, within four years, on such buildings and improvements at League Island as shall authorize the abandonment of the old yard. The Treasury may then, by its sale, be reimbursed for the money advanced to create the new establishment.

New York.—I am impelled by recent experience to say that I trust that no legislation may interfere with the preservation of the New York navy-yard in its present site and in its integrity. The present moment shows in the clearest manner how invaluable this yard is to the Navy in utilizing in a time of emergency the vast naval resources of construction, equipment, and repair which its central position enables it to draw from the ship-yards, docks, machine-shops, and stores of the great city that surrounds it, teeming with a population of skilled artisans.

Pensacola.—I think it very important that the Pensacola navy-yard, burnt during the rebellion, but with many of its improvements unharmed, should be in some degree rebuilt. In the event of complications in, or near, the Gulf of Mexico or West Indies, it would be a station of vast importance.

New London.—I again call attention tothe obligations of the Government in regard to the naval station at New London, in Connecticut.

We are the owners, by gift from the State, of a large and valuable property at this place, which has never been utilized for want of adequate means appropriate for the purpose. The considerations in favor of this site have been frequently presented, and I will only add that all that we have done there in the past has been done so well and so cheaply as to give an earnest for the future, and induce the belief that a well-found and supplied naval station at this point would be extremely valuable to the service and to the country.

ORDNANCE.

The report of the Chief of the Bureau of Ordnance, though brief, is highly interesting and satisfactory, especially with reference to the great advancement made in the manufacture of gunpowder and the perfection attained in the production of a suitable cartridge for small-arms.

The operations of this most important branch of our naval service have been closely confined within the appropriations, the narrow limits of which prevented any elaborate experiments being made in testing the manifold improvements which occupy the attention of ordnance men abroad.

The Bureau has, nevertheless, been extremely vigilant in collecting the necessary data to enable it to proceed intelligently in the solution of any of the great questions relating to naval armament whenever Congress may grant the requisite authority and supplies. In the mean time its resources are sufficient for the armament of every ship which can at present be placed in commission. Nothing in its economy appears to have been neglected, and it only remains to increase its efficiency by a liberal appropriation. Otherwise nothing, practically, can be done to keep pace with the movements of European navies.

Unquestionably the efficiency of a man-of-war is measured by the power of her battery, and the respect paid to our flag is in a direct proportion to the number and caliber of the guns which defend it.

I most earnestly recommend that ample provision be made for the support of this Bureau in order that nothing may interfere with its efforts to arm our ships with the most powerful guns.

NAVAL PENSION FUND.

Statement of the number and yearly amount of pensions of the Navy on the rolls November 1, 1873, and the amount which was paid during the last fiscal year.

	On the rolls November 1, 1873.	Yearly amount of pensions on the rolls November 1, 1873.	Amount paid for pensions during fiscal year ending June 30, 1873.
Navy invalids	1,484	$155,310 75	$160,971 98
Navy widows and others	1,799	290,516 00	302,936 71
Total	3,283	445,826 75	463,908 69

ESTIMATES AND EXPENDITURES.

The appropriations made by Congress for the fiscal year which ended June 30, 1873, including the amount of the special appropriation made last winter, and expended before the date named, were in the whole $20,589,601.57, and the actual expenditures for that period, viz, from July, 1872, to June 30, 1873, chargeable to these appropriations, including the expenditure during the time named of the special appropriations above referred to, amounted to $19,552,272.16, or something more than a million less than the whole amount appropriated. The appropriations made for the current year commencing July 1, 1873, amount in the aggregate, including the special appropriation for the new sloops of war, (less the small amount expended before June 30, 1873,) to the sum of $23,147,857.68. The amount of these appropriations for the current year drawn, up to the first of the present month, is $10,008,182.63, which, reduced by the amount remaining in the hands of the paymasters and agents of the Government, will leave about $6,500,000 as the amount actually expended from the current appropriations during the working months of this year.

A detailed account of the monthly expenditure of the Navy appropriations for the fiscal year 1872–'73, and for the present year (1873–'74) to November 1, will be found in the Appendix.

ESTIMATES.

Pay of officers and seamen of the Navy	$6,500,000 00
Pay of civil establishment in navy-yards	343,215 50
Ordnance and Torpedo Corps	651,344 71
Coal, hemp, and equipments	1,500,000 00
Navigation, navigation supplies	122,500 00
Hydrographic work	59,800 00
Naval Observatory, Nautical Almanac, &c	59,050 00
Repairs and preservation of vessels, &c	3,505,000 00
Steam-machinery, tools, &c	2,200,000 00
Provisions	1,587,600 00
Repairs of hospitals and laboratories	50,200 00
Surgeons' necessaries	40,000 00
Contingent expenses of various departments and bureaus	468,600 00
Naval Academy	129,707 40
Support of Marine Corps	1,105,911 25
Naval Asylum, Philadelphia, &c	69,307 00
Maintenance of yards and docks	860,000 00
	19,252,235 86

And to these is added the sum of $864,589.28 for current repairs of buildings, docks, and incidental expenses in navy-yards, &c.

These estimates are less than those of last year by rather more than $2,000,000, but they do not include any extraordinary expenditure for the permanent improvement of the Navy, nor the amounts necessary either for the repair of our iron-clad fleet, nor for the continued prose-

cution of some of the great works necessary to the proper condition of our naval establishment.

The foregoing is a general report of the condition, situation, and movements of the United States Navy for the past year, and until the commencement of the present month. Since that time, however, events have taken place which make it proper that the Navy should be put at once upon a footing for active service. It is by no means the province of this Department, as such, to take part in the conduct or discussion of any diplomatic question, nor should its attitude, at a time when serious international difficulties are possible, be held to indicate anything more than a determination on the part of a military department of the Government to be prepared for action, should the necessity for action arise. This is the present condition of public affairs, and such is the attitude of the Navy Department.

I have felt it to be my duty, under existing circumstances, to take promptly every means in my power to put our available force in the best possible condition for immediate and active service. All the power and means of the Department are now devoted to this end, greatly aided at every point by the enthusiastic activity of officers of every grade of the service.

Difficult of accomplishment as our purpose at first seemed, difficulties and even apparent impossibilities, are found to fade away before determination and organized activity, and the Navy is already in such a condition, that those to whom our interests and honor are now intrusted, may be relieved from the embarrassments of a situation, where just determination might be disregarded, because thought to be powerless, or decent consideration be mistaken for fear.

It is neither necessary nor proper that I should enter here into the details of our preparations; suffice it to say, that a respectable force of war-vessels and monitors is already on the sea, and concentrating at the station nearest the scene of our possible difficulties; that our whole available iron-clad fleet is in hand, and every wooden war-vessel that will float, in active preparation at the various naval stations. These will be ready for sea, fully fitted, as fast as proper crews can be provided for them; and if the necessity for action should come, before the time for it arrives, all that there is of the American Navy, which can be put afloat on the Atlantic Ocean, will be in condition and position to take its proper part.

Inadequate as this force may reasonably be deemed to the responsibilities and pretensions of a government like ours, and greatly at disadvantage as we certainly will be, in respect of number and character of vessels in a contest, with the fleets of any respectable naval power, I believe that the activity, skill, science, and experience of our Navy

will be found equal to any difficulty which courage dares to meet or energy will avail to conquer. They are thoroughly imbued with the spirit, educated in the details, and experienced in the warlike duties of their profession, skilled in the use of all the terrible weapons which science has provided for modern warfare, and of a mood to meet any crisis without shrinking from danger. Thus prepared and in this spirit, they are ready to meet any of their country's adversaries with the means with which their country provides them.

In taking the action above referred to, the Navy Department has already incurred considerable expense, and has been forced to assume some responsibilities unusual in time of peace, but, convinced of the wisdom of prompt and decided action, I have not shrunk from these responsibilities, nor hesitated, with your approval, to make warlike preparations, in the interests of peace and of humanity. I confidently rely for support in this attitude upon the patriotism and good sense of the American people and their representatives, who cannot fail to remember that our naval condition is the result of causes which have been constantly pressed upon their consideration, but which have failed to receive full attention, doubtless on account of more pressing present requirements and obligations; and who will also clearly realize that duties constantly postponed are certain to be more difficult and much more expensive, when performed in haste, under the pressure of imperious necessity.

The Department has had no necessity to overstep its appropriations, even if it were lawful to do so, but the pressing demands of the present will consume now, what was provided for the service of the year, in several of the working Bureaus. These must be promptly relieved if their work is to go on.

The occasion has shown clearly, I think, that our Navy, as it exists, should at least be put in a condition for active service, and in any event a moderate appropriation for this purpose ought at once to be made. And if war should by any possibility come, we must be liberally provided to utilize the means we have and to provide others to meet the emergency.

GEO. M. ROBESON,
Secretary of the Navy.

The PRESIDENT.

SUPPLEMENT.

MOVEMENTS OF VESSELS IN COMMISSION.

EUROPEAN STATION.

The vessels on the European station are: Wabash, (flag-ship,) 45 guns; Congress, 16 guns; Alaska, 12 guns; Shenandoah, 11 guns; Wachusett, 6 guns.

The Brooklyn and Plymouth have returned from the station during the year. The former was put out of commission at Boston July 18, and the latter at Portsmouth June 28.

All the vessels above named, except the Alaska, left Cadiz October 30, 1872, and separated the same evening. Their movements, respectively, have been as follows:

The Wabash, then bearing the flag of Rear-Admiral James Alden, arrived at Gibraltar November 1, left on the 5th; arrived at Tangier the same day, left on the 9th, and arrived at Cartagena on the 13th. She sailed from the latter port on the 23d, and, in company with the Wachusett, reached Villefranche on the 26th. She sailed from Villefranche January 15, 1873, and the next day, with the Brooklyn and Wachusett in company, arrived at Spezia. Thence she proceeded, about January 25, to Naples and to Malta, arriving at the latter place March 3. About the 12th of March she sailed with the Wachusett for the Levant and the Archipelago. Having visited Alexandria, she left that port April 2, and on the 5th arrived at Piræus. She proceeded thence to Syra, sailing April 19 and arriving same day; left there on the 23d, arrived at Leghorn May 1; sailed on the 22d, and reached Villefranche the following day. June 2, Rear-Admiral Alden was relieved by Rear-Admiral A. Ludlow Case.

Bearing the flag of Rear-Admiral Case, the Wabash sailed from Villefranche June 12, for Trieste, and after touching at Genoa, Palermo, Messina, and Syracuse, arrived July 6. From Trieste she sailed July 21, and on the 24th arrived at Corfu. August 5 she left Corfu for the Spanish coast, touched at Messina from the 7th to the 8th, and reached Cartagena on the 14th. She remained on the coast of Spain until October 27, giving attention to our interests at Cartagena, Barcelona, &c., and then proceeded to Villefranche for provisions, &c., arriving on the 31st.

The Congress arrived at Gibraltar October 31, 1872, from Cadiz, left November 5; arrived at Malta on the 15th, left on the 21st; arrived at the Dardanelles on the 25th, left there the 30th, and arrived at Jaffa on the 8th of December. She sailed from Jaffa December 13, touched at Beirut, Port Said, Alexandria, and Messina, and arrived at Naples January 16, 1873. She left Naples February 16, and the next day arrived at Spezia. From Spezia she proceeded, March 7, to Villefranche; arrived the following day. Sailed again the 16th, touched at Marseilles and Malaga, and reached Gibraltar on the 24th. April 22 she took the store-ship Guard in tow, and left for Trieste, at which latter port she arrived May 3, having touched on the way at Brindisi. She left Trieste

May 10, touched at Messina on the 13th, and on the 17th reached Villefranche. June 6 she sailed from Villefranche for the north of Europe, to visit some of the ports of Ireland, England, Germany, Holland, and France. She returned to the Spanish coast in October, and has been cruising in that quarter since.

The Brooklyn arrived at Cartagena November 3, 1872, from Cadiz, left on the 4th; arrived at Palermo on the 18th, left on the 20th; arrived at Messina on the 22d, left on the 24th, and arrived at Naples the next day. She left Naples on the 10th of December, visited Spezia, and arrived at Villefranche on the 27th. * * * January 22, 1873, she sailed from Spezia; arrived at Naples on the 24th, left on the 19th of February; arrived at Villefranche on the 21st, left on the 28th for Barcelona; arrived March 2, left on the 21st; arrived at Gibraltar on the 24th, and on the 31st sailed from the last-mentioned port with the Supply in tow, for Trieste, arriving there April 10. She left Trieste April 24, touched at Naples, and arrived at Villefranche May 7th. On the 2d of June she left Villefranche, bearing the flag of Rear-Admiral Alden, for the United States, touched at Gibraltar and Bermuda, and arrived at New York July 10, whence she was sent to Boston and put out of commission July 18.

The Shenandoah arrived at Tangier October 31, 1872, from Cadiz, left on the 4th November; arrived at Gibraltar the same day, left on the 10th; arrived at Algiers on the 15th, left on the 19th; arrived at Tunis on the 22d, left on the 27th; arrived at Malta on the 29th, and left there December 2 for Milo and Athens, reaching the latter port on the 10th. She sailed on the 26th for Syra and Smyrna. January 8, 1873, she left Smyrna, touched at Syracuse, Port École, Civita Vecchia, and Leghorn, and arrived at Spezia on the 29th. March 3 she sailed for Villefranche, arrived the next day; left the 7th; arrived at Barcelona on the 9th, left May 6; touched at Port Mahon, from 7th to the 17th, and reached Villefranche on the 19th. June 7 she sailed from Villefranche to visit Barcelona and other ports on the coast of Spain. She remained on the coast until November 5, looking after American interests at Malaga, Barcelona, Tarragona, Cartagena, &c., and then proceeded to Nice to prepare for a cruise to Egypt and Syria.

The Wachusett left Cadiz October 30, 1872, in company with the flag-ship, and continued with her till she reached Villefranche November 26, having touched at Gibraltar, Tangier, and Cartagena. She left Villefranche December 8, visited Marseilles and Barcelona, and returned January 1, 1873. She again sailed, in company with the flag-ship, January 15, visited Spezia, Naples, Malta, Alexandria, Port Said, (took the admiral to Jaffa, and returned to Alexandria,) Piræus, Malta the second time, Palermo, Barcelona, and returned to Villefranche May 17. June 7 she sailed from Villefranche, visited Majorca, Marseilles, Ajaccio, Messina, Corfu, and Brindisi, joined the flag-ship at Trieste, and accompanied her to Corfu. From Corfu she was sent to the coast of Spain, and has been in that quarter ever since, visiting Santander, Ferrol, Coruña, Cartagena, Cadiz, and other ports.

The Plymouth arrived at Malaga November 1, 1872, from Cadiz, left on the 3d; arrived at Barcelona on the 9th, left on the 16th; arrived at Toulon on the 18th, left on the 26th, and arrived at Villefranche on the 28th. She sailed from the last-named port December 16, touched at Genoa, and arrived at Spezia on the 21st. From Spezia she proceeded, January 22, 1873, to Lisbon via Villefranche and Gibraltar, and arrived there February 10. She left Lisbon on the 17th of February for the United States via the coast of Africa and the West Indies.

The following places were visited by her: Canary Islands in February; ports Porto Praya and Porte Grande, Monrovia, and Cape Palmas, in March; Elmina, Cape Coast Castle, Fernando Po, Gaboon River, and St. Paul de Loando in April. She left St. Paul de Loando April 28, was at Bridgetown, Barbadoes, 1st to 6th June, and arrived at New York June 18; whence she proceeded to Portsmouth, N. H., and was put out of commission June 28.

The Alaska was put in commission at New York, August 6, 1873, from which port she sailed August 28, touched at Newport, and arrived at Cadiz September 25, since which time she has been stationed on the Spanish coast.

THE NORTH ATLANTIC STATION.

Rear-Admiral Gustavus H. Scott relieved Rear-Admiral Joseph F. Green of the command of this station at Hampton Roads May 15, and is now in command.

The following vessels are now or have been attached to the station at some time during the past year: Worcester, (flag-ship,) 15 guns; Canandaigua, 10 guns; Powhatan, 17 guns; Richmond, 14 guns; Pawnee, 2 guns; Wyoming, 6 guns; Shawmut, 3 guns; Nipsic, 3 guns; Terror, 4 guns; Saugus, 2 guns.

The movements of the vessels above named have been as follows:

The Worcester, bearing the flag of Rear-Admiral Green, having visited St. Thomas, St. John's, Porto Rico, Samana Bay, and Havana, arrived at Key West November 29, 1872. She remained there until February 3. 1873, and sailed for Matanzas, arriving the following day. She left Matanzas February 11, and arrived at Havana the same day. Left Havana the 26th, and arrived at Key West February 27. March 17 she sailed again on a cruise to the southward, arrived at Bridgetown the 2d and left the 5th of April; arrived at St. Pierre, Martinique, April 7, and left the next day for Puerto Cabello; arrived on the 12th, and sailed the same day for Santiago de Cuba; arrived at Santiago de Cuba April 18, and remained until the 22d; arrived at Kingston 24th, left on the 25th, and arrived at Key West May 5.

May 15 Rear-Admiral Scott relieved Rear-Admiral Green, and the latter proceeded in the Powhatan to Boston, where he hauled down his flag May 28.

The Worcester remained at Key West until July 5, when she came to Norfolk for repairs. August 25 she left the navy-yard for Bermuda; arrived there on the 21st. She sailed from Bermuda September 4, arrived at Hampton Roads on the 10th, off the anchorage on the 13th; went to the yard on the 20th, repaired, and sailed again from Hampton Roads for Key West November 18, and arrived there the 23d.

The Canandaigua sailed from Key West December 12, 1872, on a cruise to the southward; arrived at Samana December 24, left on the 26th; arrived at St. Thomas on the 28th, and left January 5, 1873. She was at Pointe à Pitre from the 9th to the 14th of January; at La Guayra from the 17th to the 20th; at Porto Cabello the 21st and 22d; at Curaçoa from the 24th to the 30th; at Santa Martha from the 1st to the 4th of February. February 10 she left Carthagena and arrived at Aspinwall on the 12th; left on the 14th, and reached Havana the 26th. She remained at Havana until March 4, and the following day reached Key West. March 25 she proceeded to Matanzas; remained there until the 31st, and the same day arrived at Havana. She left Havana April 5, touched at Matanzas, remaining there until the 10th,

and arrived at Key West on the 11th. May 10 she left for Vera Cruz, via New Orleans, or the Southwest Pass, to convey the United States minister to his destination. The minister was disembarked at Vera Cruz on the 25th of May, and on the 31st the Canandaigua sailed for Key West, and arrived there June 9. On the 19th of June she sailed for Aspinwall and arrived the 29th. She remained there until August 3, when she proceeded to Kingston, Jamacia, for the benefit of the health of the crew, arriving on the 9th. She left Jamaica September 11, touched at Key West, and reached Hampton Roads, September 25, and was sent thence to Philadelphia for repairs.

The Wyoming sailed from Key West December 14, 1872, landed the United States consul-general to Cuba at Havana, and proceeded thence on a cruise to the southward. She reached San Juan January 2, 1873, and left on the 9th for San Barbara de Samana; thence she proceeded to Santo Domingo City, and Jacmel and Aux Cayes, and arrived at Kingston on the 19th. From Kingston she went to Port au Prince, also to Gonaives, Nicola Mole, and arrived at Santiago de Cuba February 4th. She le.t there on the 9th, touched at Matanzas, and reached Key West on the 19th. March 15 she proceeded to the Mexican coast, where she remained until June 4, and returned to Key West June 14. From Key West she came to Hampton Roads, arriving July 10, and went up to the yard on the 25th. August 6 she sailed for Aspinwall via Bermuda and Kingston; arrived at Bermuda August 28, sailed September 2; arrived at Kingston September 9, left on the 20th, and arrived at Aspinwall September 25, where she remained until November, when she went to Santiago de Cuba.

The Nipsic, from November, 1872, to January, 1873, was visiting the ports of Santo Domingo. January 7 she left Samana for Silver Bank Passage to examine shoals in the vicinity. She subsequently visited Cape Haytien, Guatanamo, and Havana, and arrived at Key West February 2. She left Key West February 13, on surveying service, on which she was engaged to 13th March, when she proceeded to San Juan for supplies, &c. April 10 she left for Samana, arrived on the 12th, left on the 14th, searched for Silver-Bank Passage Shoal, Clarion Shoal, Ciudado Reef, visited Matthew Town, and arrived at Nuevitas May 6. She proceeded thence to Key West via Matanzas, and arrived May 16. June 23 she left for Hampton Roads, thence for New York, and was put out of commission July 26.

The Shawmut was under repairs at Key West until March 5, when she sailed for and arrived at Havana the next day. She left Havana for Matanzas, March 26, and arrived the same day. She remained at Matanzas until April 28, when she proceeded to Key West. June 23 she left Key West for Hampton Roads; arrived on the 30th. July 30 she arrived at Washington, and has since been under repairs.

The Saugus left Philadelphia November 28, 1872, arrived at Key West February 13, via Norfolk and Savannah, and has since been at anchor in that harbor.

The Terror, having been relieved by the Saugus, left Key West May 17 in tow of the Powhatan, arrived off the Delaware River May 24, and came up to Philadelphia, where she was put out of commission June 10.

The Pawnee arrived at Key West February 8, 1873, from Pensacola, and has been stationed there since that time.

The Richmond was commissioned at Philadelphia November 18, 1872; sailed, December 15, for Norfolk, arrived there the 19th; left Hampton Roads January 31, 1873; reported for duty on the station at Key West February 11, where she remained until the 23d, and proceeded to survey

a supposed shoal near Jupiter Inlet. She returned to Key West March 9, left the 13th, arrived at San Juan, Porto Rico, the 22d; left the 28th, surveyed a shoal in the vicinity of Bolandar Head, and arrived at San Domingo City the 31st. She left San Domingo the same day, proceeded to Kingston, Jamaica, arrived there April 3, left the 5th for Santiago de Cuba, and arrived on the 7th. She remained there until the 12th, and effected the release of certain American seamen who were being tried, then proceeded to Guantanamo Bay; thence to Port au Prince and Cape Haytien. She left the latter place April 15, arrived at Havana on the 19th, left on the 21st, and arrived at Matanzas same day. She left Matanzas on the 29th, and arrived at Key West on the 30th. May 10, having been detached from the station, she left Key West for the North Pacific station, arrived at Rio de Janeiro July 7, sailed on the 26th, and reached Valparaiso October 4. She left the latter port October 25 for San Francisco.

The Powhatan, with the Saugus, left Philadelphia November 28, 1872, and arrived at Key West, via Norfolk and Tybee Roads, February 13, 1873. During the month of April she was employed a few days in assisting the telegraph company. May 6, she went over to Havana, returned on the 8th, and on the 17th left for Boston, via the capes of the Delaware, with the Terror in tow; arrived off the capes May 24, and at Boston May 28. July 25 she left Boston for Hampton Roads, and arrived on the 29th. In August she proceeded to Halifax, and returned to New York in September. In November she was ordered to Philadelphia, which port she left the 25th of that month with the Manhattan for Key West, but returned and took a second departure December 5, the last time from Wilmington.

THE SOUTH ATLANTIC STATION.

The vessels on this station are: Lancaster, (flag-ship,) 22 guns; Ticonderoga, 11 guns; Wasp, 1 gun.

The Ticonderoga is about sailing for the United States. Rear-Admiral William Rogers Taylor was relieved by Rear-Admiral James H. Strong, at Rio de Janeiro, October 31.

The movements of the vessels have been as follows:

The Lancaster having completed repairs about the middle of November, 1872, left Rio de Janeiro on the 25th of that month for the La Plata. January 18, 1873, Rear-Admiral Taylor transferred his flag temporarily to the Wasp and made a visit to Buenos Ayres, Rosario, and Colonia, and returned to Montevideo February 9. The Lancaster in the mean time made a cruise to the south, returning about the 9th of February. She remained in the vicinity of the La Plata until the latter part of May, visiting Moldanado, Montevideo, St. Catharines, and Santos, and arrived at Rio de Janeiro June 11. She remained at Rio under repairs until August 28, when she proceeded on a cruise northward, arriving at Bahia September 16, leaving there the 29th and returning to Rio de Janeiro October 7. October 31, Rear-Admiral Taylor was relieved, as above stated.

The Ticonderoga sailed from Montevideo December 30, 1872, for Rio de Janeiro, where she arrived January 22, 1873. She left Rio January 28, for Santos and St. Catharines, and arrived at Montevideo from the last-named port March 14. She remained in the vicinity of the La Plata until about the middle of April, when she proceeded to Rio de Janeiro, arriving May 28. June 30 she proceeded southward again—visited Montevideo, Buenos Ayres, St. Catharine's, Santos, and returned

to Rio de Janeiro October 20, from which port she expected to sail for the United States.

The Wasp, in November, 1872, visited Moldanado and Rio Grande de Sul, and was used by Rear-Admiral Taylor temporarily to visit, in January, Rosario, Buenos Ayres, and Colonia, from which service she returned to Montevideo February 9. In April she went to Colonia and returned to Montevideo May 3. She remained there, having new tubes put in her boilers, until fall. When last heard from, October 6, she was at Asuncion, having conveyed the United States minister up the Paraguay.

THE NORTH PACIFIC STATION.

The vessels on the North Pacific station are: Saranac, (flag-ship,) 11 guns; Benicia, 12 guns; Richmond, 14 guns.

The California was put out of commission at San Francisco July 3, and the St. Mary's, which returned from the station, at Norfolk, June 17.

The movements of the several vessels have been as follows:

The California, bearing the flag of Rear-Admiral Pennock, arrived at Honolulu January 15, from San Francisco, where, on account of affairs at the Sandwich Islands, she remained until May 7, then returned to San Francisco, arriving May 25. Rear-Admiral Pennock having transferred his flag to the Saranac, hoisting it June 28, the California was put out of commission as above stated.

The Richmond arrived at San Francisco December 4, from the North Atlantic station, and reported for duty on this station.

The Saranac arrived at San Francisco November 23, 1872, from Panama and intermediate ports. She sailed again in January, 1873, for the Mexican and Central American coasts. In February she visited Mazatlan, San Blas, and Acapulco, and in March, Punta Arenas, Corinto, and La Union, and returned to Acapulco March 16. April 25 she arrived at San Francisco, and June 28, Rear-Admiral Pennock transferred his flag to her. She left San Francisco July 5, on a northern cruise, and arrived at Esquimault on the 12th, left there on the 16th for Sitka, via the inland passage, anchored at numerous places on the way, and reached Chilcat Village, head of navigation, on the 30th. Leaving Sitka August 19, she returned the same route, visited Port Townsend, Seattle, Steilacoom, Olympia, and reached San Francisco September 29. October 7 she sailed for Honolulu and arrived on the 19th.

The Benicia arrived at Honolulu January 4, 1873, from San Francisco, and remained at the Sandwich Islands until the latter part of March. While there the flag was temporarily transferred to her. April 7 she arrived at San Francisco, filled up with stores, made some repairs, and sailed May 5 for Panama. She touched at some of the Mexican and Central American ports, and arrived at Panama August 12. In the latter part of September and early part of October she co-operated with the flag ship of the South Pacific station, by landing a force at Panama for the protection of American citizens and property.

The St. Mary's sailed from San Francisco, November 23, 1872, for the Atlantic States. She arrived at Valparaiso January 23, 1873, left there February 20, arrived at Barbadoes April 28, touched at St. Thomas, and arrived at Norfolk June 3, where she was put out of commission as above stated.

The Narragansett arrived at Callao January 1, sixty-five days from Sydney, Australia. She made certain repairs and alterations at Callao,

sailed March 20, and arrived at Panama April 2. From Panama she proceeded to Lower California, and has been engaged in surveys in that vicinity.

THE SOUTH PACIFIC STATION.

The vessels now on this station are, the Pensacola, (flag-ship,) 22 guns; Omaha, 12 guns; Onward, 3 guns.

The Tuscarora was early in the year on the station, but was withdrawn for special service.

The movements of the vessels have been as follows:

The Pensacola, flag-ship of Rear-Admiral Charles Steedman, arrived at Talcahuano December 4, 1872, from Payta; left there on the 12th, and arrived at Valparaiso on the 14th of December. She remained at the last-mentioned port until March 20, when she proceeded to Coquimbo, arriving on the 22d. She left Coquimbo April 1, and arrived at Callao on the 9th; left Callao on the 22d for Panama, touching on the way at Payta, and arrived May 8. At Panama she landed a force for the protection of American citizens and their property during the revolution. She sailed from Panama June 2, arrived at Payta on the 10th and at Callao on the 18th, where she remained until the 9th of July, and then proceeded to Coquimbo. In September she left for Panama, where on the 22d of that month Rear-Admiral Steedman was relieved by Rear-Admiral John J. Almy. Shortly after the latter took command of the station, a second landing of men was made from the Pensacola for the same purpose as in the first instance. The Pensacola remained at Panama until October 23, when she proceeded south, bound for the coast of Chili.

The Omaha, which sailed from Philadelphia October 8, 1872, to join the station, arrived at Valparaiso February 6, 1873. March 20 she left Valparaiso in company with the flag-ship, and arrived at Coquimbo on the 22d. She remained at Coquimbo until April 7, when she proceeded to Callao, via Iquiqui, and arrived on the 21st. June 2 she left Callao for Panama, and arrived on the 15th. On the 25th of June she sailed for Guayaquil, thence to Coquimbo and Valparaiso. She was at Callao August 30.

The Tuscarora left Valparaiso October 30, 1872, for Callao, and on the 24th December sailed from the latter port for Panama, to co-operate with the Darien surveying expedition. She arrived at Panama January 1, 1873, and was engaged in this service until May 17, when she sailed for San Francisco, via Acapulco. She was at Acapulco from May 26 to June 1, and arrived at San Francisco June 25. She was subsequently engaged in surveying on the northwest coast, to determine a suitable route for a submarine cable, and returned to San Francisco from this service November 6.

The Onward has been permanently stationed at Callao.

ASIATIC STATION.

The following vessels comprise the force now on the Asiatic station: Hartford, (flag-ship,) 18 guns; Iroquois, 6 guns; Lackawanna, 10 guns; Saco, 3 guns; Palos, 6 guns; Monocacy, 6 guns; Ashuelot, 6 guns; Yantic, 3 guns; Idaho, 7 guns.

The movements of the vessels on this station during the past year have been as follows:

The Colorado left Hong-Kong November 21, 1872, arriving at Singapore on the 28th, and on the 2d of December sailed for the United States, touching at Anjer and Cape Town, and arrived March 12, and was put out of commission March 25, 1873.

The Hartford arrived at Point de Galle, Ceylon, via Suez Canal, on February 20; from thence to Penang, and, leaving March 3, arrived at Singapore on the 6th; from thence to Manila, arriving March 22; thence to Hong-Kong, arriving 30th March. On the 3d of April, Rear-Admiral Jenkins changed his flag to the Hartford from the Lackawanna. The Hartford left Hong-Kong for Amoy 30th April, arriving May 2; leaving the same day, arrived at Shanghai on the 10th; remained at Shanghai until July 12, when she left for Wusung; and in a few days sailed for Nagasaki, arriving on July 21; remained in Nagasaki until October 4, then sailed for Woosung, arriving on the 6th. On the 12th October entered the Yang-tse River, arriving at Chin-Kiang on the 14th; will reach Kiu-Kiang to-morrow, and will proceed to Hankow; from Hankow she will return to Shanghai, and thence to Hong-Kong, to arrive there about the 1st of December.

The Lackawanna left Hong-Kong, in company with the Colorado, November 21, 1872, arriving at Singapore on the 29th; sailed from Singapore December 6, calling at Pulo Penang, and remained four days; sailed thence to Calcutta, arriving December 20; sailed from Calcutta January 3, 1873, touching at Penang, and arrived at Singapore January 15; thence to Bangkok, arriving January 29. On February 8 sailed for Saigon, arriving on the 13th; thence on the 18th for Manila, arriving on February 26; sailed from Manila March 1, arriving at Hong-Kong 4th March, remaining until the 20th; in company with the Monocacy visited Macao and Whampoa, the Monocacy carrying my flag to Canton; returned to Hong-Kong on April 2, and sailed for Yokohama on the 10th, arriving on the 20th; remaining a short time in Yokohama, sailed for Nagasaki, visiting Kobe *en route*, and arriving at Nagasaki June 1; on June 12, in company with Yantic and Saco, sailed for Shanghai, arriving on the 15th; on the 18th of July sailed from Shanghai for Che-foo, arriving on the 22d, remaining two days; made short visits to Teng-chu-fu, Taku, and Ninghai; thence to Nagasaki, arriving August 2; sailed from Nagasaki to Wadwostok, Russian Siberia, arriving 28th, and left 31st August; thence to Hakodadi, arriving September 3; arrived, probably, at Yokohama about October 15, and is at this date on her way to or at Nagasaki.

The Iroquois, having been under repairs at Shanghai, left March 12, for Nagasaki, arriving on the 15th; thence on the 21st March to Kobe; thence on the 2d April to Yokohama, arriving on the 4th. Left Yokohama April 29, arriving at Shanghai May 4. Remained in Shanghai until July 22, when she sailed for Nieu-chwang; remaining there from July 28 until August 9th; thence to Nenghai, 10th August; Taku Bar, 11th to 13th August; Teng-chu-fu, 15th to 17th August; arriving at Che-foo August 18. On September 9 sailed for Shanghai, arriving on the 11th and leaving on the 17th; arrived at Chin-Kiang, Yang-tse River, on the 19th, and on the 15th October left for Shanghai.

The Saco, having been under repairs at Shanghai, sailed from thence on the 1st March for Nagasaki, arriving on the 5th; left on the 8th for Kobe, arriving on the 11th; left on the 17th for Yokohama, arriving 19th of March. Again left Yokohama May 1; in Kobe from 6th to 8th, arriving in Nagasaki on the 10th. In company with Lackawanna and Yantic sailed June 12 for Shanghai, arriving on the 15th. Left Shanghai June 30th, arriving at Taku Bar July 4, and proceeded to Tien-tsin; remained there until August 22; in Che-foo from 24th to 27th August, arriving at Nagasaki 31st August. Left Nagasaki September 8, visiting Kobe *en route*, and arrived at Yokohama 15th September, where she still remains.

The Yantic sailed from Zanzibar January 23, arriving at Seychelles

on February 1, and leaving on the 14th; Point de Galle, from 5th to 9th of March; Pulo Penang, 22d and 23d of March; Singapore, 25th March to 2d of April, reaching Hong-Kong 15th of April. Left Hong-Kong May 18, calling at Amoy, 21st to 25th of May; Foo-chow, 26th to 29th May, reaching Nagasaki 5th of June. On the 12th of June, in company with Lackawanna and Saco, sailed for Shanghai. Left Shanghai June 30, calling at Nagasaki from 3d to 6th of July, Kobe 8th to 9th, arriving at Yokohama on the 11th. Sailed from Yokohama September 16, Kobe 19th to 20th September, reaching Nagasaki on the 22d. Sailed for Shanghai October 4, arrived on the 6th. She is under orders to go to Hong-Kong, and thence proceed to visit Manila and the ports in the Philippine Islands to the southward of Manila, Ilo-Ilo, Zebu, &c., and the Sulu Sea; to visit Brunai, capital of Borneo, Batavia, Singapore, Acheen, Penang, and Malacca.

The Ashuelot left Tien-tsin on July 3, arriving at Nagasaki on the 10th. Sailed from Nagasaki August 5, calling at Kobe on the 8th, arriving at Yokohama on the 14th, and remains at Yokoska, Japanese government dock-yard, under repairs.

The Monocacy left Shanghai for the ports on the Yang-tse River on November 13; in Chin-Kiang from 14th to 16th; in Kin-Kiang, 18th to 20th, reaching Hankow on the 21st. Remaining until the 28th of December, started down the river; Kin-Kiang 29th to 30th, 1872; Chin-Kiang from 1st to 15th of January, 1873, arriving at Shanghai on the 17th. Left Shanghai February 8, calling at Foo-chow, 11th to 15th February; Amoy, 16th to 19th; Swatow, 20th to 24th, reaching Hong-Kong February 25. Left, in company with Lackawanna, for Macao March 20 to 24, thence to Canton, the Lackawanna remaining at Whampoa. Left Canton April 1, arriving at Hong-Kong on the 2d. Sailed from Hong-Kong April 27; calling at Swatow 28th to 29th; Amoy, 30th April to 3d of May; Foo-chow, from 5th to 11th of May; Ningpo, from 13th to 16th, reaching Shanghai on the 17th. Sailed from Shanghai on July 16; Nagasaki, July 20. Left Nagasaki 24th, Kobe, 26th, arriving at Yokohama July 28, and went to Yokoska, where she is under repairs, which will be completed about November 1.

The Palos sailed from Ningpo January 22, reaching Shanghai on the 23d, leaving on the 26th to visit the ports on the Yang-tse River. On account of low water did not reach Hankow until April 4; remained until May 12, and, visiting the treaty-ports on her way down, reached Shanghai May 12. Leaving Woosung July 18, arrived at Nagasaki on the 22d. Sailed August 6, calling at Kobe 8th and 9th, arriving at Yokohama on the 11th, and went to Yokoska on the 12th, where she is under repairs at Japanese government dock-yard. She is expected to be ready for service by the 1st of November, and will be sent to Tien-tsin, on the Peiho River, for the winter.

The Idaho was towed by the Yantic on the 25th of July from Yokohama to Yokoska, and is stationed at the latter place.

The Alaska arrived at New York from this station February 14, and was put out of commission February 26.

MISCELLANEOUS.

The Supply was put in commission at New York February 8, 1873, to carry out American contributions to the Vienna Exposition. She sailed March 5, and arrived at Trieste April 10, having been towed from Gibraltar by the Congress. She arrived at New York November 22, (on return from this service,) and was put out of commission December 3.

The Guard was commissioned at New York February 1, 1873, for the

same service as the Supply, and sailed March 22. She reached Trieste May 3, having been towed by the Congress from Gibraltar. She has not returned.

The Kansas, on special service connected with the Nicaragua survey, left Hampton Roads December 3, 1872, and arrived off Greytown December 20. She returned to New York from this service July 23, 1873. While on the Central American coast she was frequently at Aspinwall, protecting American interests in that quarter. November 14 she sailed from New York for Santiago de Cuba.

The Portsmouth, specially fitted out for surveying service in the Pacific, sailed from New York late in December, 1872, and arrived at Talcahuano, Chili, March 20, 1873. She proceeded thence to Valparaiso and Honolulu, arriving at the latter port May 23. She has been engaged in surveying and in examining reported dangers in the Pacific, making Honolulu her headquarters. She was at that port October 7, and expected to sail, October 9, on a surveying cruise.

The Constellation, with the cadet-midshipmen on board, left Annapolis, June 9, on a practice-cruise; passed the capes of the Chesapeake June 20, and came to anchor off Newport, R. I., July 20. She passed the remainder of the summer in that vicinity and in the adjacent waters of Long Island Sound and Gardiner's Bay, and, September 6, sailed for the Chesapeake. She reached the inside of the capes September 9, and on the 29th of that month returned to the Academy.

The Fortune was commissioned at the Washington navy-yard June 20, and on the 24th proceeded to Annapolis, where the cadet-engineers were received on board, and left again July 5. She visited Wilmington, Del., Chester, Philadelphia, New York, Cold Spring, West Point, and Boston, and returned to Annapolis, via Washington, September 27.

The Juniata was put in commission at Boston, February 10, 1873; went around to Newport, and thence to New York, arriving at the latter place May 7. She was assigned to special service in connection with the search for the Polaris, and her movements are detailed in the Secretary's report. November 19 she sailed from New York for Cuba.

The Ossipee was commissioned at New York October 10, 1873; left there, November 14, for Newport, thence for Hampton Roads, arriving on the 20th. With the Mahopac in tow, bound to Key West, she passed the capes November 25.

The Mahopac was commissioned at Norfolk, November 21, 1873, and left Hampton Roads on the 20th for Key West.

The Manhattan was commissioned at Philadelphia, November 19, 1873, and in company with the Powhatan started for Key West on the 25th. She returned to Wilmington, after passing the capes of the Delaware, December 1, and sailed again December 5.

The Monongahela was put in commission at Portsmouth, N. H., September 22, 1873; left there, October 2, for Newport, and sailed from the latter place for the Pacific November 12.

The Gettysburg was commissioned at Washington November 6, 1873, taking the place of the Tallapoosa.

The Pinta was commissioned at Philadelphia November 22, 1873, and sailed on the 25th for Key West.

The Mayflower sailed from Portsmouth, N. H., November 22, for Boston, New York, Norfolk, and Key West.

The Bluelight, engaged on special service under the United States commissioner on fish and fisheries, left Washington June 28 for the coast of Maine. She returned to Portsmouth, N. H., September 6, and was put out of commission September 13.

APPENDIX.

No. 1.

ESTIMATES SECRETARY'S OFFICE, &c.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1875, *by the Navy Department.*

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1874.
SECRETARY'S OFFICE.		
SALARIES.		
For salary of Secretary, per act of March 3, 1853, (10 Stat. at L., p. 212, sec. 4)	$10,000 00	.....
For salary of chief clerk, per acts of July 5, 1862, (12 Stat. at L., p. 510, sec. 3,) and July 16, 1870, (16 Stat. at L., p. 249, sec. 1)	2,500 00	.....
For salary of disbursing clerk, per acts of July 5, 1862, (12 Stat. at L., p. 510, sec. 3,) and July 12, 1870, (16 Stat. at L., p. 249, sec. 1)	2,000 00	.....
For salary of four clerks of class four, per acts of March 2, 1865, (13 Stat. at L., p. 454, sec. 1,) and March 3, 1871, (16 Stat. at L., p. 492, sec. 1)	7,200 00	.....
For salary of four clerks of class three, per acts of July 5, 1862, (12 Stat. at L., p. 516, sec. 3,) and March 3, 1871	6,400 00	.....
For salary of two clerks of class two, per acts of July 5, 1862, (12 Stat. at L., p. 511, sec. 3,) and March 3, 1871	2,800 00	.....
For salary of three clerks of class one, per acts of July 5, 1862, (12 Stat. at L., p. 511, sec. 3,) and March 3, 1871	3,600 00	.....
For salary of two messengers, at $840 each, per act of July 12, 1870, (16 Stat. at L., pp. 240, 250, sec. 192)	1,680 00	.....
For salary of two laborers, at $720 each, per acts of July 12, 1870, and March 3, 1871	1,440 00	.....
	37,620 00	$37,620 00
CONTINGENT EXPENSES.		
For stationery, furniture, newspapers, and miscellaneous items	5,000 00	5,000 00
NAVY DEPARTMENT BUILDING.		
SALARIES.		
For salary of superintendent	250 00	.....
For salary of five watchmen, per acts of July 5, 1862, (12 Stat. at L., p. 511, sec. 3,) March 3, 1869, (15 Stat. at L., p. 297, sec. 1,) and July 12, 1870	3,600 00	.....
For salary of two laborers, per acts of March 2, 1865, (13 Stat. at L., p. 454, sec. 1,) March 3, 1869, (15 Stat. at L., p. 297, sec. 1,) and July 12, 1870	1,440 00	.....
	5,290 00	5,290 00
CONTINGENT EXPENSES.		
For incidental labor, fuel, lights, and miscellaneous items	7,000 00	7,000 00
NAVY.		
CONTINGENT EXPENSES.		
Rent and furniture of buildings and offices not in navy-yards; expenses of courts-martial, courts of inquiry, boards of investigation, examining-boards, with clerks' and witnesses' fees, and traveling expenses and costs; stationery and recording; expenses of purchasing-paymasters' offices at the various cities, including clerks, furniture, fuel, stationery, and incidental expenses; newspapers and advertising; foreign postage; telegraphing, foreign and domestic; copying; mail and express wagons, and livery and express fees and freight; all books for the use of the Navy; experts' fees and costs of suits; commissions, warrants, diplomas, and discharges; relief of vessels in distress, and pilotage; recovery of valuables from shipwrecks; quarantine expenses; care and transportation of the dead; reports, professional investigation, and information from abroad; and all other emergencies and extraordinary expenses arising at home and abroad, but impossible to be anticipated or classified	125,000 00	100,000 00

No. 2.

NAVAL ACADEMY.

REPORT OF THE BOARD OF VISITORS.

UNITED STATES NAVAL ACADEMY,
June 2, 1873.

SIR: The Board of Visitors appointed "to attend the Academy during the May examination, for the purpose of witnessing the examination of the graduating and other classes, and of examining into the state of the police, discipline, and the general management of the institution," have the honor to present the following report:

The board entered upon its duties on the morning of May 20, all the members, with a single exception, being present. After the customary formal reception by the Superintendent and officers of the Naval Academy, the board organized by the choice of Rear-Admiral Charles H. Davis, U. S. N., as president, Bvt. Maj. Gen. Joseph J. Reynolds, U. S. A., as vice-president, and William H. Hackett, esq., as secretary.

For the purpose of observing as carefully as possible the stated examinations, the board appointed a standing committee, whose duty it should be to assign the members from day to day to attendance at the various class-rooms. This arrangement secured the presence of from one to three members at each examination, and, on one day, the board in a body attended successively all the examinations in progress. Standing committees were also charged with the duty of examining the general condition and management of the Academy, as respects the grounds and buildings, the system of police and discipline, the course of study and methods of instruction, and such other matters as might from time to time suggest themselves.

These committees examined in detail and with great care the several matters referred to them, and the results of their investigations were in all cases presented to the meetings of the board, and there fully discussed. The board is able to say, therefore, with entire confidence, that its conclusions are based upon as careful observation and reflection as could be bestowed upon so important subjects within the limited time allowed. The Superintendent and his entire corps of assistants placed within reach of the board every possible facility for the performance of the duties assigned to it, and it may be stated, in general, that the present condition of the Academy is in every important respect exceedingly prosperous and satisfactory.

The board is glad to believe that any prejudices against the Academy, which may have formerly existed, have passed away; or that, if they still exist, it is only in cases where the real facts are imperfectly understood.

All the appointments of the place are in excellent order. The grounds are kept in the most neat and tasteful condition; the arrangements for the various kinds of drill and exercise are admirably adapted to the instruction of the cadets in a knowledge of their duties, as well as to maintain a high standard of physical health; and the course of study land methods of discipline are thorough and successful.

The suggestions and recommendations that have been agreed upon, to be presented in this report, are accordingly made, not so much as criticisms upon the present organization, as indications of some particular directions in which the system already established may be made stil

more successful and efficient. While there have been differences of opinion among the members of the board on some important subjects, the conclusions here presented have been adopted with substantial unanimity, and on one point, at least, there has been a most cordial and emphatic agreement, viz, that the Academy should be supplied with the very best equipment in men and appliances that can be furnished. No economy could be more unwise than that which would withhold from a national institution like this anything that could increase its vigor and efficiency. Whatever the exigencies of the future may require of the military arm of the United States service, it seems inevitable that the Navy should steadily increase in relative importance, both as an arm of defense along our extended coast-lines, and as a means of maintaining our widening intercourse with other parts of the world. It seems the obvious dictate of good judgment, therefore, that the officers who are to be intrusted with the responsible duty of directing this branch of the service should receive the most thorough training, theoretical and practical, that the resources of the country can supply.

In order to present the conclusions of the board as briefly and clearly as possible, they may be grouped under a few distinct headings.

I.—THE GROUNDS AND BUILDINGS.

These, as has been already indicated, are as well kept as could be desired. The chapel, the library, the new mess-hall, and some others of the buildings, are well adapted to the purposes for which they are intended, though it seems desirable, as previous boards have recommended, that the laundry and water-closets should be removed from the basement of the mess-hall, as soon as the purchase of additional ground, for which provision has already been made by a law of Congress, shall be completed. A few additions to the buildings, however, are imperatively needed at once.

1. *A new armory.*—The building now used for this purpose is in every respect unfit. It is so low on the ground that it has been found necessary to overlay a second floor upon the first, in order to keep it approximately dry; but this does not prevent the upper floor from being perceptibly damp for weeks together; moreover, the main walls are so insecure that one of them has to be supported by props, and there is a general appearance of shakiness about the structure, which is only partly concealed by an abundance of paint.

2. The growing wants of the department of steam-enginery require some enlargement of the building occupied by it. This is one of the most important and successful departments of the institution, and the board is unanimously of opinion that its needs should be supplied in the most liberal spirit. It is understood, from plans prepared under the direction of the Navy Department, and submitted to the board, that the necessary room can be secured at a comparatively trifling expense, by making some simple additions to the present building, without essential modification of its plan or appearance.

3. The accommodations for the department of physics and chemistry are altogether insufficient. The instructors in these subjects, and in mechanics, are obliged to use the same lecture-room, which can only be done at great and almost daily inconvenience; and the laboratory for the use of students in analytical chemistry can accommodate only eight at a time. The supply of apparatus, too, is entirely inadequate. The present appropriation for this purpose ($250) ought to be at least quad-

rupled. A better and better-ventilated lecture-room, a larger and better-equipped chemical laboratory, and a physical laboratory fitted up with an ample supply of the most approved apparatus, are absolutely necessary to save this department from being a discredit to the Academy and the Government.

4. The board emphatically concurs in the recommendation which has been made in former years, that some provision be made for a swimming-school. The importance of this seems sufficiently obvious, without a word of argument.

5. The board is also of opinion that the proposed purchase of additional grounds, which has already been referred to, is a measure of importance to the Academy, if it can be consummated on reasonable terms. An undesirable neighborhood will thereby be removed from immediate proximity to the Academy, the water-front will be considerably extended, and room will be secured for marine barracks, in place of the present structures, which are entirely unfit for the purpose, with other buildings that may from time to time be required.

II.—THE COURSE OF STUDY.

The board has been most favorably impressed with the excellence of the methods of instruction here pursued, and the satisfactory results attained. The whole course of study is arranged with a view of securing one practical end, the training of good officers for the Navy. The academic studies are accordingly taught with constant reference to their applications, and the practical exercises are conducted as models of practice in actual service, as well as illustrations of fundamental principles.

No one can examine the matter carefully without a high appreciation of the work that the Academy is doing, both in the way of furnishing the service with a body of accomplished and efficient naval officers, and of developing, with remarkable success, a system of education which combines in due proportion the theoretical and the practical.

An educated man, as the phrase ordinarily goes, may not be a good officer, and a good officer is not necessarily an educated man; but the graduates of the Naval Academy can scarcely fail to be both. In a few particulars the board is of opinion that the course of study, without the introduction of any radical changes, might be considerably improved.

1. It is found, for instance, that a good many cadets drop out of the Academy at the close of the first year, from inability to keep up with their class. During the last ten years about fourteen hundred cadets have entered the Academy, five hundred of whom have left before the middle of the second year. These are boys who are not thoroughly grounded in a knowledge of arithmetic, or have not studied algebra at all before entering the Academy. The rule seems to be that boys who are not well prepared in these two points are unable to go on successfully with the studies laid down for the first year (fourth class) of the course in the Academy. It would be, on every account, undesirable to lessen the amount or lower the standard of work required in that year; and the board therefore strongly recommends that arithmetic, elementary algebra, English grammar, and descriptive geography be added to the requirements for admission. This would but slightly raise the nominal standard; and it would exclude very few, if any, who are likely to maintain a respectable standing in the course as now organized. As the case now is, the requirements for admission, annually announced,

are a standing invitation to boys to enter the Academy whose preparatory training is not such as to make it probable that they can succeed in completing the course. A wrong is thus done to the Government as well as to the individual concerned, and the board proposes only that the full amount of preparation which is really needed shall be distinctly stated.

2. The board also recommends that cadets be appointed a full year in advance, whenever it is possible, as is now done at the West Point Academy. This would enable candidates to make their preparations more thorough, and thus greatly diminish the risk of subsequent failure and mortification.

3. By a law of Congress, enacted at its last session, it is provided that the course of study for the class entering the Academy in 1873, and subsequently, shall be six years instead of four. It has been thought by some that the two additional years should be spent in service at sea; but, after a careful consideration of the subject, this board earnestly recommends that one of the years be spent in additional study at the Academy. The principal reason for this recommendation is, that the cadet-midshipmen are already receiving about three months of sea-practice every year, and therefore do not, in the opinion of those best qualified to judge, need so much additional service before entering the grade of midshipmen; while there are many subjects, either altogether omitted from the present course, or but little studied, in which more instruction is very desirable. The amount of French and Spanish now taught is insufficient. It is important that the knowledge of modern languages, once acquired, should be retained and increased by constant use, either by continuing the instruction through every year of the course, or by pursuing, in text-books written in these languages, some of the subjects taught in the higher classes. Much more time should be devoted also to the study of international law (with a more suitable text-book than Kent's first nine Lectures) and constitutional law. In ethics no instruction whatever has been given for some time past, and in order to remedy this deficiency, as it is understood the Superintendent proposes to do the coming year, some other study of perhaps equal importance must be displaced. The same may be said respecting the law of naval courts-martial, which now is not studied at all, but the importance of which, to the complete education of a naval officer, is obvious. The elements of mental science, logic, and political economy ought also to be studied; and more time is needed for history in general, and military and naval history in particular. It is, however, plainly impossible to introduce these various subjects, or any of them, into a course already overcrowded. The only resource is, either to omit some important subjects that are now pursued, or else to extend the time. The board carefully considered the former alternative, with a particular view to the question whether some portion of the studies in higher mathematics might not, perhaps, be dropped from the course. The result of the examination was, however, a unanimous conviction that more rather than less time could be profitably devoted to these branches, and that no part could be omitted without seriously impairing the success and usefulness of the entire system. The whole scheme of teaching in the department of mechanics is made to depend on the doctrines of the calculus; and the calculus, in turn, is habitually taught, by an original and highly successful method, with direct reference to its practical applications. The board is therefore driven to the conviction that an addition of one year to the present course of study is essential to the

symmetry and completeness of a system which is already producing admirable results, but which may be made by this means to produce still better ones.

4. It is also recommended that the course of study for cadet-engineers be increased to four years, instead of the two now provided by law; and that they be admitted, according to the present standard of qualifications, at not less than sixteen nor more than twenty years of age. During the first two years of their course, at least, the cadet-engineers could profitably be placed in the same classes with the cadet-midshipmen, taking the same studies throughout, with the simple exception of having steam-enginery in place of seamanship and navigation. The last two years of their course would then be devoted to the higher mathematical and scientific studies, which are essential to a thorough knowledge of their profession. Closely connected with these recommendations is the one that a text-book on steam-enginery adapted to the wants of this department of the Academy, be prepared under the direction of the Secretary of the Navy. The progress made in steam-enginery during the last fifteen years is such that the books now in use are no longer sufficient, and since it is found necessary for the Government to train up its own engineers, it seems desirable that they be instructed in the most approved methods.

5. There is one other recommendation respecting the organization of the Academy which the members of the board agree in considering of greater importance, if possible, than any of those already presented. It is that the heads of academic departments should be placed upon a more permanent footing, and so liberally remunerated that the very best talent in the country could be secured for these places. The heads of such departments as mathematics, chemistry, physics, mechanics, astronomy, international and constitutional law, and others that may perhaps be designated as departments of research, ought to be men of the greatest ability and eminence, whose lives are devoted to the sole business of investigating and teaching their particular subjects. In these days of rapid advancement in every branch of scientific knowledge, no man, however able, can keep fully abreast of discovery, even in his own field, if he is liable to alternations of service on sea and on land. The board wishes distinctly to say that these remarks are intended to be the statement of a general principle, and not, in any sense, a criticism on the ability or success of the gentlemen now holding these positions in the Academy. All of them are believed to be doing their work well, and some of them with exceptional excellence and success. But these would probably be the first to admit that their work would be more satisfactory to themselves and more productive of large results, if it were the pursuit of a life-time rather than a brief tour of duty. It is probably no exaggeration of the truth to say that the one measure which more than any other would enhance the success of the Academy, would be the establishment of a few permanent, well-paid professorships, capable of attracting the very highest order of talent and service.

6. With respect to religious instruction, the condition of the Academy is not all that could be desired. The subject has been considered by the board with the most serious attention; and while they are free to admit the serious difficulties involved in it, a large majority believe that a decided improvement might be effected by a change in the method of appointing the chaplain. It is recommended that, instead of detailing a naval chaplain for a brief term of duty at the Academy, a clergyman be selected, well known for learning, ability, eloquence, and piety, and

with special fitness for wielding an influence over young men, and that the position be placed by law upon such a footing as will secure for it men possessing these qualifications in the highest degree.

III.—SANITARY CONDITION—DISCIPLINE AND DRILL.

With respect to the general condition of the Academy in the matters of health, police, discipline, and drill, the board need only repeat the emphatic commendation already expressed. The health of the cadets is probably as good as that of any similar body of young men in the world. During the last year there have been no deaths, and but very little sickness. The various kinds of exercise secure the double result of preserving a robust physical condition and furnishing a practical training-school. The prescribed routine could hardly be improved upon in these particulars, and every visitor is struck with the appearance of manly vigor and self-possession which the cadets, singly and collectively, present. The board witnessed exercises in nearly every important kind of military and naval drill with very great gratification. The skill, and promptness, and accuracy exhibited were alike creditable to the intelligence of the young men and the faithfulness of their instructors.

The discipline of the Academy, on which all else depends, is in a state of efficiency which leaves nothing to be desired. It is scarcely possible to speak in too high terms of the patience, fidelity, and success with which Superintendent Worden discharges the laborious duties of his position. There seems to be no detail of administration which does not pass under his watchful and careful eye, and nothing which affects the welfare of the institution is too insignificant to enlist his attention. There is in the management of affairs a judicious blending of strictness with a kindly interest in the personal welfare of the cadets, which results in securing a very high standard of discipline and efficiency.

The board has been especially impressed with the earnestness with which the Superintendent has appealed to the honorable instincts of young men, in a series of orders directed against various petty barbarisms, at the same time that he has kindly, but firmly, warned them of the inevitable consequences of a continued course of ill-conduct.

The best commentary on the wisdom of the methods adopted is to be found in the present state of the institution, as it has been already described.

It would be unjust not to mention, in this connection, the ability and faithfulness of the Superintendent's adjutants, the commandant of midshipmen, the heads of departments, and their various assistants. They constitute together a body of men who reflect credit upon the institution and the Government. Some of them bear honored wounds, and others the seeds of disease contracted amid the hardships and perils of an exacting and laborious service. But it may be doubted whether the service which they are now rendering to the country is less important or valuable than that which they were lately called upon to perform amid the sterner scenes of actual war.

In conclusion, the board desires to express its conviction that the more generally the people of the country become acquainted with the affairs of the Naval Academy the more cordially will they insist upon maintaining it at the highest possible standard; and in order that it may be habitually and directly brought to the attention of their representatives, it is respectfully suggested that it might be well to have each House of Congress represented in the Board of Visitors.

It is recommended, also, that the regulations of the Academy relating to police and discipline be carefully revised, and then enacted into law by Congress.

All of which is respectfully submitted.

C. H. DAVIS,
Rear-Admiral and President.
J. J. REYNOLDS,
Col. Third Cav., Bvt. Maj. Gen., Vice-President.
ALVAH SABIN, *Vermont.*
DAVID A. WALLACE, *Illinois.*
G. W. ATHERTON, *New Jersey.*
THOMAS H. DUDLEY, *New Jersey.*
WILLIAM H. HACKETT, *New Hampshire.*
CHAS. G. ROGERS, *Tennessee.*
ALVA A. KNIGHT, *Florida.*
DON A. PARDEE, *Louisiana.*
GEO. HENRY PREBLE,
Captain, United States Navy.
CHARLES H. BAKER,
Chief Engineer, United States Navy.

UNITED STATES NAVAL ACADEMY,
Annapolis, Md., October 27, 1873.

SIR: I have the honor to submit the annual report of the Superintendent of the Naval Academy.

The estimates for the support of this institution for the fiscal year ending June 30, 1875, were transmitted to the Department on the 27th August last.

The number of students in the several classes at the beginning of the academic year 1872–'73 was 262, viz: 233 cadet-midshipmen; 35 cadet-engineers, and 4 Japanese students, as follows:

	Members.	
Cadet-midshipmen—first class	29	
second class	34	
third class	49	
fourth class	115	
		227
Cadet-engineers—first class	15	
second class	20	
		35
Total		262

The course of studies prescribed by the regulations was pursued as usual until the 20th day of May last, when the annual examination of the several classes commenced, and was continued, in the presence of the Board of Visitors, until the 31st of the same month, when it was concluded.

The first, or graduating, class of cadet-midshipmen was composed of 29 members, including Zuu Zow Matzmulla, the first Japanese student educated under the resolution of the Senate and House of Representatives of the United States, approved July 27, 1868. These gentlemen received their certificates of graduation as midshipmen on the 31st of

May. The first class of cadet-engineers, 5 in number, also received their certificates of graduation at the same time, when they were all detached from the Academy, with orders to report their respective places of residence to the chief of the Bureau of Navigation and officer of detail, Washington, D. C.

Mr. Zuu Zow Matzmulla, the Japanese student, was then detached with instructions to proceed to Washington and report to the honorable the Secretary of the Navy for transfer to the authorities of the empire of Japan.

On June 2, all of the members of the present second class of cadet-midshipmen were, under the regulations, granted leave of absence, and on the 4th, the several classes, viz, late second and now first class, 29 members; late fourth and now third class, 56 members; and the transfers to the present fourth class, 16 members, making a total of 101 cadet-midshipmen, were embarked for the practice-cruise on the United States ship Constellation, Commander A. P. Cooke, commanding.

The examination of candidates for admission to the Academy as cadet-midshipmen commenced on the 5th of June, when 83 presented themselves for examination, 6 of whom were withdrawn, and 1 left pending the examination, and 32 were rejected by the academic board, and 44 were found duly qualified and admitted.

The Constellation sailed from her anchorage June 9, and from the outer roads on the 12th, touched at Hampton Roads, leaving the capes, crossed the Gulf Stream, and cruised to the westward of the Bermudas; recrossed the Gulf Stream, and cruised north along the coast between Montauk Point and the capes of the Delaware; touched at Newport, R. I., cruised in the vicinity and adjacent waters of Long Island Sound and Gardiner's Bay; from thence sailed for and cruised in Chesapeake Bay, and arrived in Annapolis Roads on the 27th of September.

The steamer Fortune was detailed and fitted at the navy-yard at Washington, D. C., as a practice-vessel for the practical instruction of the cadet-engineers, and being reported ready to receive her officers, I ordered Lieut. Commander Alexander H. McCormick, United States Navy, to the command fo her, and the other officers detailed for her to proceed to Washington and report to the commandant of the navy-yard on the 16th of June, for duty.

The Fortune was put in commission on June 20th, and on the 24th she got under way for and arrived in Annapolis Roads on the 25th. On the 2d of July the cadet-engineers, 18 in number, were embarked, and on the 5th she proceeded on the practice-cruise, touched at Wilmington, Del., Chester and Philadelphia, Pa., New York City, Cold Spring, and West Point, N. Y., Boston and Charlestown, Mass., and at Washington, D. C., on her return. During her stay at these places the cadet-engineers were treated with much consideration, and, in charge of an officer, visited and inspected all the iron-foundries, rolling-mills, machine-shops, steam and marine engine works, as well as the several navy-yards, &c., and arrived in Annapolis Roads on the 27th of September.

The examination of candidates for admission as cadet-engineers commenced on the 15th, and was concluded on the 25th day of September. During that time 48 presented themselves for examination; 1 was rejected by the medical board, 1 withdrawn pending the examination, and 46 examined, and a report of their proficiency, arranged in order of general merit, was prepared and transmitted to the Department. These young gentlemen were, like the candidates of the last two years, subjected to a thorough competitive examination, but taking into consideration the ages at which they presented themselves, I regret to be com-

pelled to repeat the language of my last two reports, that they did not, on examination, exhibit that proficiency generally which young men of their ages should have acquired. Of the number examined the first 16 were appointed cadet-engineers and received into the Academy on probation.

In this connection I would respectfully recommend that hereafter all the candidates for this corps be required to report on the 15th day of September for examination, instead of the 15th and 25th, as at present prescribed. This would greatly expedite the examination and enable the board to conclude it before the examination of candidates for admission as cadet-midshipmen commenced, and also give to the Department time to appoint the cadet-engineers, and have them here by the 1st day of October of each year.

I beg leave also to state that the experience of the last two years has clearly demonstrated the insufficiency of the time allotted to the course of studies at present prescribed for the classes of cadet-engineers; and, in consideration of the difficulty of obtaining young men duly qualified for admission under the existing regulations, and in order that these students may be given the full advantage of the facilities for instruction offered by the Academy, I recommend that one more academic year be added to the present course of studies now prescribed by law, and that the course be thus modified for three instead of two academic years, as at present.

I would also recommend that a larger and more suitable steamer, of the most approved type of machinery, be detailed for the practical instruction of the cadet-engineers. The Fortune is imperfectly equipped and entirely too small for the accommodation of the classes to be embarked in her.

On the 20th September, the examination of candidates for admission as cadet-midshipmen was renewed; 106 presented themselves for admission, 5 of whom were rejected by the medical board, 51 by the academic board, 1 was withdrawn pending the examination, and 49 were found duly qualified and admitted, making the number found qualified and admitted in June and September, 93, and 1 Japanese student; and the total number of students in the Academy on its re-opening, 276, viz, 236 cadet-midshipmen, 37 cadet-engineers, and 3 Japanese students.

I have also to recommend that hereafter all candidates for admission to the Academy as cadet-midshipmen be required to report for examination between the 5th and 8th of June, and between the 20th and 23d of September, of each year, instead of the 5th and 15th of June, and the 20th and 30th of September, as at present prescribed. This would greatly expedite the examination, give ample time for it, and enable the academic board to conclude it, and be ready, on the arrival of the practice-ship from her summer cruise, to take up and conclude the re-examination before the beginning of the next academic year, viz, 1st of October.

During the last academic year, five candidates for admission to the United States Marine Corps, as second lieutenants, presented themselves for examination, three of whom were found duly qualified for appointment, and two were rejected under the regulations governing their admission.

That the Department may be fully informed relative to the particulars of the cruise of the Constellation and the Fortune, I transmit herewith copies of the reports of Commander Augustus P. Cooke and Lieut. Commander Alexander H. McCormick, the commanding officers of these vessels.

In conclusion, permit me to refer the Department particularly to that portion of the reports of Commander Cooke and Lieut. Commander McCormick, relative to their officers, and to express my gratification at the able and zealous manner in which they performed their duty, and to reiterate my approval of confining the practice-ships to our own coast, where the students can have greater advantages for practical instruction, rather than sending them on long, and, when the weather is unfavorable, tedious passages, thereby rendering their arrival here by the beginning of the next academic year quite uncertain.

I am, sir, very respectfully, your obedient servant,

JOHN L. WORDEN,
Rear-Admiral, and Supt. Naval Academy.

HON. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES PRACTICE-SHIP CONSTELLATION,
Annapolis Roads, September 27, 1873.

SIR: I have the honor to submit the following report of the summer's practice-cruise with the first and third classes of cadet-midshipmen embarked for instruction.

The cadet-midshipmen were received on board June 4. The ship sailed from Annapolis June 9, and made her way leisurely down the bay, stopping a short time at Hampton Roads, and finally sailing from the capes of the Chesapeake on the 20th of June.

Steering directly across the Gulf Stream, where the sea was a little rough, but weather quite pleasant, we cruised for a week to the westward of Bermuda. Nearly all the midshipmen were sea-sick during the second day out, but most of them soon recovered. Recrossing the stream, in about the same latitude, with pleasant weather, we came north along the coast, and cruised between Montauk Point and the capes of the Delaware.

On the 20th of July we arrived in Newport for the purpose of recruiting and refreshment. The remainder of the time was passed in that vicinity, and in the adjacent waters of Long Island Sound and Gardiner's Bay, until the 6th of September, when we sailed for the Chesapeake, and arrived inside the capes on the 9th instant. The cruise was continued in the bay until September 27, when we returned to the Academy.

The line-officers of the ship were all detailed from the Academy, and consisted of the usual complement for a sea-going vessel: one executive officer, one navigator, and four watch-officers, together with an assistant navigator, whose special duty was instruction in navigation. Upon these officers devolved, not only the regular duties of the ship, but also the instruction of the cadet-midshipmen—no light task where the time of a hundred young men was to be kept properly employed.

It would be a great advantage to send a special instructor from the department of seamanship, on each practice-cruise. With a larger force of instructors the work could be more thoroughly accomplished.

The senior class consisted of thirty members, all of whom had been on a practice-cruise before; the junior class contained seventy members, most of whom were enjoying their first experience at sea.

The complement of men available for watch duty amounted to about one hundred and fifty. The whole together, men and midshipmen,

formed the ship's company, and were stationed as such; the latter handling the light sails, yards, and masts entirely by themselves. First-class men were selected as captains of each part of the ship, over their own people, and were given charge of the young gentlemen in their own parts, the same as are petty officers ordinarily. At quarters the midshipmen were stationed in guns' crews by themselves.

On the 1st of August the station of each midshipman and all hands was changed so that each should have an opportunity of working aloft and in different parts of the ship. At sea they kept watch and watch during the day, and quarter-watches during the night.

The men were berthed and messed on the gun-deck. It is very essential, for obvious reasons, that the crew of a practice-ship should be of superior quality, yet this one was no exception in that particular to what is found generally in the ships of the service; a large proportion being ignorant of a sailor's duty.

The cadet-midshipmen occupied the whole of the berth-deck, which was fitted up with lockers and tables as a large steerage, the forward part being arranged as a commodious wash-room, and furnished with a bountiful supply of sea-water for bathing purposes.

The midshipmen were divided into a convenient number of mess-crews, occupying the different tables. Before each meal the crews were formed on the lee side of the quarter-deck for muster and inspection under the immediate charge of the mate of the berth-deck, and under the general supervision of the officer of the deck. At these formations all general orders were issued and reports published.

A mess-committee of two of their own number, detailed monthly by themselves, acted as caterers, and had charge of the purchases and expenditures, under the supervision of the executive officer. A steward, cook, baker, and sixteen servants were allowed the midshipmen's mess.

The total mess-bill, including charge for crockery and outfit, averaged about $16 per month. The necessary tin-ware and extra galley-furniture required, cost them over $200 each year. It would reduce their mess-bill somewhat if the Government would allow an outfit of copper utensils for this purpose. In order to get competent men as steward and baker, they have to pay about twice the Government allowance for those rates.

Allowing a liberal expenditure of water, this ship carries sufficient to last about sixty days. The practice-ship should be fitted with the means of condensing water and furnishing her own supply, as it may sometimes be very inconvenient to procure it. This summer, had it not been for the kindness of the authorities at the torpedo station, in assisting us from their limited supply, we should have experienced much delay in replenishing our tanks at Newport.

A quantity of articles, appertaining to a midshipman's outfit, was transferred from the naval store-keeper at the Academy to the paymaster of this vessel, and served out as required. The supply proved ample. Great care should be observed that the midshipmen are furnished with a certain specified outfit complete, before embarking; then the necessity for further supplies would be very rare, except of such articles as are liable to loss or destruction on ship-board.

The officers commanding the divisions of cadet-midshipmen rendered clothing-lists of the outfit on hand each month. In order to accomplish this, they required the midshipmen to furnish invoices of all articles on hand. There was always some difficulty in keeping the lists corrected, as the midshipmen had not been accustomed to such accountability for the supplies received. Great care has always been exercised in scru-

tinizing requisitions; but after an article is once granted, there does not seem to be sufficient care taken that it is properly expended, and articles received on requisition are sometimes irregularly disposed of without authority.

The fatigue-dress worn by the cadet-midshipmen on ship-board is not well adapted to the service, nor is it at all attractive in appearance; and the latter is no mean consideration where it does not involve additional expense, as one's bearing is improved by a consciousness of being becomingly clad. It would be difficult indeed to excite any enthusiasm on the score of personal appearance with the present fatigue costume, and certainly none is exhibited.

The fatigue jumper is an ungainly affair, and should be exchanged for a neat and appropriate dress, such that white shirts could be dispensed with at sea, except on special occasions, when parade-clothes would be worn. This would do away with the immense accumulation of wash-clothes which occurs, and then arrangements could readily be made for having the midshipmen's underclothing washed on board.

The fatigue-cap is a common Scotch affair, which is entirely inappropriate, and should give place to a neat visorless, sailor-looking cap, which would be no more expensive, and far more becoming.

The senior class are required to copy the complete watch, quarter, and station bills of the ship. For this purpose they are furnished blank-books, in which they have to rule all the necessary forms. This is an exceedingly long, tedious, and irksome task, without any compensating benefit. The time could be much more profitably employed, and they could better afford to pay an extravagant price for the printed bills, than to expend the time necessary to make a copy of them.

The practice-cruise is an essential portion of the course at the Academy, for the purpose of giving practical instruction in the professional branches there taught, and to furnish correct ideas of the economy and management of a man-of-war.

In order to make the best use of the time, and to have the course afloat and ashore in harmony, complete regulations and instructions for the guidance of the officers engaged in this important service are as essential as for any other portion of the academic course. It does not appear that such regulations have ever been thoroughly digested and promulgated.

The course of instruction pursued this summer has been as follows:

The senior-classmen were divided into two sections, those in each watch constituting a section. The executive officer and senior watch-officer instructed them in seamanship. They were required to make notes of everything that was done for their instruction, and these notes, when corrected, were copied into their blank-books. The watch below during the forenoon received special instruction in seamanship. This instruction was entirely practical, and comprehended the following points: Working anchor and chain, including bending and unbending lower and sheet chains; bitting and unbitting; bringing to and heaving in with capstan and deck-tackle, and stowing chains in locker; calling and fishing; securing the anchors for sea, and getting them off the bows; carrying out and weighing kedges, with boats, and carrying out bower anchors and forty-five fathoms chain, with boats; letting go, heaving up, and transporting sheet-anchor, from bow to waist; mooring and unmooring, and clearing hawse. Securing yards for purchasing heavy weights; hoisting out and in boats; lowering and hoisting boats at sea, and in a tideway, and the manner of securing them for sea. Making preparations for a gale: reefing down, bending storm-sails, and battening

down hatches. Making preparations for sending down lower yards and topmasts in heavy weather; shifting topsail-yards; bending and unbending sail, and shifting sail both at anchor and under way. Getting under way and anchoring; making, reefing, shortening and furling sail under different circumstances of wind and weather. Also the usual exercises of light yards and masts, loosing and furling sail, &c.

Each individual was given an opportunity of seeing all these things done, of studying them carefully, and then recording the result in note-books, which were afterward submitted for criticism; the object being to teach habits of observation and create an interest in everything pertaining to the practical part of the profession.

During the first half of the cruise a first-classman kept watch with the officer of the deck, and was required to make rough notes of everything that was done, and submit them at the expiration of his tour of duty for the commanding officer's inspection. In these notes they were required to give the routine orders, as well as the reasons for everything done.

In this connection they were given theoretical instruction in the manner of handling sail under different circumstances, and also in the effect of the different disposition of sail upon the ship in the various evolutions.

During the latter half of the cruise the first-classmen were put in charge of the deck and kept regular watches, both at sea and in port, except night-watches at sea, and were each given an opportunity to perform various evolutions, such as tacking and wearing, making and shortening sail, &c.

From the commencement of the cruise they did duty as officer of the forecastle, midshipmen of the quarter-deck, mates of lower decks and hold, and midshipmen of tops, besides regular boat duty. In each of these positions they were instructed in the various duties, particular attention being paid to informing them of the duties of the men in each part of the ship. They were required to heave the lead and steer the ship habitually. Each one was required to make a complete copy of the station-bills, and to keep a copy of the ship's log.

The junior class was divided into three sections, one being taken from both watches, and the other two, each, from one watch. Each section was under the direct supervision of a watch-officer, who was responsible for its instruction in seamanship.

At sea, except in bad weather, the watch below was required to study and make notes of the rigging, &c., and record them in suitable blank-books. The watch on deck was employed in the same manner, when its service could be spared for a sufficient length of time; otherwise, it was taught knotting and splicing, fitting rigging, &c. The officer of the afternoon watch gave his section a special drill with the sails on the mizzen-mast, if the weather was suitable.

The junior-classmen were required to draw the bowsprit and foremast, jib-boom and foretop-mast, flying-jibboom and foretop-gallant-mast, and studding-sail booms, showing all iron-work, &c., and they were required to name and describe each piece of standing rigging on these spars, in its regular order, stating use, lead, manner of fitting and of setting up. They were required to draw each yard on foremast, showing standing-rigging, iron-work, &c.; to draw each sail, and show position of bands, patches, linings, cringles, and gluts; to name and describe the use and manner of fitting and reeving each piece of running rigging used in making, taking in, reefing, and furling each sail, and in working the yards; to name and state the use of each piece of running

rigging used in rigging in and out jib and flying-jib boom; in sending up and down each yard and mast; and to describe the manner of hoisting in and out boats, and of securing yards for purchasing heavy weights. They were also taught knotting, splicing, fitting rigging, and heaving the lead, and were required to take the lee wheel when under way. They were given special exercises in making, shortening, reefing, furling, bending, and unbending sail on mizzen, and in crossing and sending down mizzen top-gallant and royal yards, and housing and fidding mizzen top-gallant-mast. The junior class was also required to keep a copy of the ship's log.

In navigation the instruction was as follows: The senior class was required to take morning time-sights, and meridian altitudes of the sun, or a sight near noon; and in addition to this every opportunity was taken to obtain sights of the moon, stars, and planets, the work on these being added to the usual afternoon work. Those having the forenoon watch were required to take their morning observations before 8 o'clock, and be ready for the duties of the watch by 8.30 o'clock. At 11.30 a. m. they were excused from watch for the purpose of taking meridian observations; and the dinner-hour was at 12.30 o'clock, so that all might dine at the same time. During the afternoon the watch below worked out their observations, and attended to such other work in navigation as might be given them by the instructor. The entire class was required, during the first month at sea, to send in the dead-reckoning daily. Much attention was paid to Sumner's method, which was frequently substituted for the ordinary sights. The variation of the compass was frequently found by azimuth and amplitude. The work was done in books, or copied into them, and sent in every evening for inspection and correction.

In port special attention was given to taking notes of the harbors and roadsteads in which the ship anchored. Sketches of all important points were taken, and descriptions given of the shores, bottom, dangers, day and night marks, tides, &c. This information was written out in full in their navigation-books. Sights were taken on shore with the artificial horizon for the determination of the chronometer-error.

The junior class was taught to work out dead-reckoning, and required to send in the ship's place by account each day. They were divided into small sections and distributed to the first-classmen for instruction in the use of the sextant and nautical almanac. They were also instructed in finding the latitude and longitude by the ordinary meridian altitude and time-sight of the sun.

In port their instruction was the same as at sea, imaginary courses being substituted for the actual run of the ship.

In gunnery the instruction consisted chiefly in target-firing at sea. This was accomplished several times, and the results are forwarded herewith.

Captain Simpson, in charge of the torpedo station at Newport, kindly offered to open his establishment for the inspection of the cadet-midshipmen, and occupied three days in explaining to the senior class, and practically experimenting with the whole torpedo outfit, as now furnished to ships of war. The midshipmen were required to submit in writing an account of what they had seen, and the result proved that most of them had profited by the opportunity.

The officers have all been particularly earnest and zealous in carrying out the objects of the cruise, and I am especially indebted to the executive officer, Lieut. Commander Batcheller, for his very able assist-

ance, whatever success may have attended our efforts being greatly due to his ability, energy, and discretion.

In conclusion, it gives me great pleasure to return in fine health, and without loss or serious accident, the young gentlemen who have been committed to my care. Having behaved excellently throughout, and, as a general rule, improved their opportunities, they are prepared with renewed energy to commence the labors of another academic year.

I am, very respectfully, your obedient servant,

A. P. COOKE,
Commander, Commanding.

Rear-Admiral JOHN L. WORDEN,
Superintendent Naval Academy.

UNITED STATES PRACTICE-SHIP FORTUNE, (4th rate,)
Annapolis, Md., September 30, 1873.

SIR: In obedience to your order I have the honor to submit to you, for the information of the honorable Secretary of the Navy, the following detailed report of the cruise of this vessel.

We were commissioned at the Washington navy-yard on the 20th of June, and on the 24th of that month, having finished our equipment, we proceeded to Annapolis, Md. There, on the 2d of July, we received on board, from the Naval Academy, eighteen cadet-engineers. Until July 5 we were engaged in settling them in their mess arrangements; on that day, with written instructions from you for the practice-cruise, we left the wharf, but ran aground on a shoal in the harbor. At midnight, by the assistance of the United States steamer Phlox, we got afloat, and proceeded on our way to Wilmington, Del., where we arrived on the morning of July 8.

By permission of Mr. Job Jackson, of the firm of Jackson, Sharp & Co., we occupied their wharf. I immediately called at the firms of Pusey, Jones & Co., Harlan, Hollingsworth & Co., Slidell & Hastings, Stottsenberger & Son, the Diamond State Iron-Works, and Lobdell & Co., and asked permission for the cadet-engineers to inspect the works and witness such manufacturing as was then going on, as well as to make sketches of such operations and machinery as were novel or instructive. My request was cordially granted by each of these firms.

Accordingly, on the afternoon of July 8, the entire class of cadet-engineers, under charge of Second Assistant R. Crawford, visited the iron-foundery of E. C. Stottsenberger & Son, where they were shown over the establishment, receiving the personal attention of the firm. During this visit, which lasted over three hours, they witnessed, and had explained to them, the whole operation of making cast-iron castings, from the preparation of the mold to the pouring of the metal, seeing the molding and casting of a "center" for a large paddle-wheel, and of a variety of smaller articles. They also had a chance to examine and make sketches of a pair of air-blast pumps for supplying the blast to the cupolas of the foundery, and of examining, internally and externally, two of the McKenzie pattern of cupolas, said to possess peculiar merit for their manner of distributing the air throughout the charge. The method of "charging" was fully explained, and likewise that of obtaining metal of different grades of hardness.

On the succeeding day the cadets were sent, under Second Assistant Engineer Crawford's charge, to visit the establishments of Lobdell & Co., car-wheel manufacturers, and of Pusey, Jones & Co., engine and

ship builders. At the former of these the cadets were accompanied by the superintendent of the works, who took occasion to point out the leading features and peculiarities of their machinery and special work. Everything relating to the molding and casting and the securing of car-wheels to the axle was fully explained and exemplified, and also the method of chilling cast iron for the purpose of hardening. The cadets witnessed in operation the driving-machinery of this establishment, which is an ingeniously contrived oscillating engine, combining, as it may be made to do, the compound engine, the condensing engine, or the non-condensing engine.

At Messrs. Pusey, Jones & Co's. the cadets were permitted to pass through the works, and witnessed the fitting up of some of the detail parts of a steam-engine. They also visited a large iron vessel on the ways, but without her machinery. They examined, however, the manner of joining the various parts of the vessel.

On the 10th of July the cadets, accompanied as before, visited the plate-iron-rolling mills of Slidell & Hastings, where they had an excellent opportunity of witnessing the various steps in plate-iron manufacture for steam-boilers and for ships, comprising the sorting of the iron with reference to quality, mixtures made to produce desired varieties, the fagoting, piling, weighing, heating, (with the furnace for same,) the handling of the igneous mass by crane and by portable tramway worked by steam-lift, and the process of rolling the mass until reduced to the desired thickness. They had explained to them the effect of the presence of various impurities in the metal, as indicated during the working, and after reduced to the desired shape. The "blooming" process of utilizing fine scrap-iron, such as filings, cuttings, &c., was fully examined. Here copious notes and sketches were made.

In the afternoon the cadets went to the extensive and complete steam railway-car-building shops of Jackson, Sharp & Co., where they were conducted by the senior member of the firm through all departments of the works, and encouraged in the examination of their peculiar machinery, improved car-trucks, patent air-brakes, couplings, &c., rendering the visit highly instructive.

On July 11, by appointment, the cadets visited the marine-engine shop and ship-yard of Harlan, Hollingsworth & Co., everything necessary to facilitate the object of their visit being cordially extended by the members of the firm and by the employés. After a general view of the works, the cadets were distributed through the various departments, such as the boiler-shop, the erecting and fitting-up shops, and the drawing-room, each having assigned to him one or more subjects to sketch and describe. In addition to this, three cadets were sent on board the large iron vessel there building, to make sketches of different parts of the framing, and to describe the manner of joining them together; the manner of securing the stern-bearing and propeller-shaft, and the arrangements of engine and boiler keelsons. Several tracings of drawings were made of the details of engines and boilers.

On July 12 the cadets visited the Diamond State Iron-Works, where they witnessed the process of converting cast into malleable iron, by the process known as "puddling;" the working of the iron to free it of cinder, and the process of refining by cutting, piling, reheating, and rolling. They also saw a number of curious machines for making various kinds of bolts, for making the nuts for them, and for cutting the thread, all of which is said to be done much more expeditiously than is usually the case.

This finished our work at Wilmington, and I beg to state that from

all of the establishments which the cadets visited, with the exception of that of Pusey, Jones & Co., they received great attention, and every facility for profitable instruction was extended to them.

From Mr. Job Jackson, who allowed us to occupy his wharf free of rent, we received much other kindness.

From this, on July 12, we proceeded to Chester, Pa., as directed, and anchored in the stream, where we remained until the 21st. I called at the office of Messrs. Roach & Son, the proprietors of the extensive iron-ship-building yard at this place, explained the design of our cruise, and obtained permission for the cadets to visit their works. Accordingly, on July 15, the cadets, accompanied at all times by Second Assistant Engineer R. Crawford, commenced inspecting these works. To enable them to transfer to their smooth journals the drawings and notes taken at Wilmington and at this place, only one-half of the class visited the yard each day, and at first a general view of the establishment was had. On succeeding trips, the details were entered upon. Here they had an excellent opportunity of familiarizing themselves with all that pertains to iron-ship building, the establishment being complete in all respects, and the superintendent, Mr. Boole, extremely obliging. No less than five iron vessels in different stages of construction were on the ways, and six others were in the water being fitted up and receiving their machinery. Two of those on the ways were very large; said to be 428 feet in length over all. The attention of the cadets was specially directed to these iron vessels. The methods of forming, setting, and securing the frames; the construction of the various kinds of keels and keelsons, with the merits and demerits of each, were duly noted; the different methods of strengthening special parts, the use of stringer-plates and stringers, tie-plates, &c., were pointed out. Afterward they made copious notes and sketches of the detail parts of engines, boilers, and vessels in process of erection. They were instructed in the manner of constructing each of these, with the various technicalities pertaining thereto. The drawing-room was visited, and useful data of engines, &c., obtained.

At another visit, details of cadets were set at work on assigned objects to sketch and describe, a notable feature being the engines and appurtenances of the Colima, an iron ship for the Pacific mail-line, fitted with machinery of improved compound type. We remained here until July 21, all of which time was devoted to the instruction of the cadets, and, I think, with great profit to them. From this we went to the Philadelphia navy-yard for a supply of coal, and there we also filled our complement of men (which was somewhat reduced by desertions) from the receiving-ship.

On July 23 we started for the Brooklyn navy-yard, where we arrived on the 24th, and permission was given us to occupy a berth at the cob-dock, and to obtain all the information possible from the machinery in the yard and on board the vessels there. Accordingly, commencing on July 28, the cadets, in two divisions, the first under charge of Second Assistant Engineer R. Crawford, and the second under Second Assistant J. S. Ogden, on alternate days, continued visiting until August 4. During that time they were engaged in taking notes, and in making sketches in the founderies, boiler-shops, and machine-shops, where the work going on was explained to them; in collecting data pertaining to the machinery of the vessels in ordinary, and in viewing and sketching parts of their machinery. For this purpose the Frolic, the flag-ship of Vice-Admiral Rowan, was also visited. They were unsuccessful in obtaining information concerning the engines, &c., of the torpedo-boat

now building, but visited and made sketches of her hull. On August 4 I obtained a steam-launch from the yard, and sent all of the cadets to the Morgan Iron-Works, in the city of New York. As these are directly connected with the ship-yard at Chester, I deemed them especially important. They were shown through these works first, and then distributed through the various departments, and to the vessels here receiving machinery. Many compound engines are built here. Much useful data respecting the practical operations of compound engines at sea was obtained. As the whole object of the visit could not be accomplished in one day, a detail of four cadets was sent over the next morning, and employed in the collection of data, and in sketching and obtaining information respecting the efficiency of various types of screw-propellers. At these works the use of the drawing-room, drawings, &c., was accorded the cadets, and First Assistant George P. Hunt gave material assistance.

On August 8 the cadets were kept on board working on their journals, copying the indicator-diagrams of various vessels fitted with compound engines, and in copying data for computing their respective horse-power, and cost, in fuel, per horse-power, in each case.

I confined our attention to the Morgan Works and to the navy-yard, thinking they offered enough for the profitable employment of our time, and because of the difficulty of getting to other establishments.

On August 9 we left the Brooklyn navy-yard for Cold Spring, on the Hudson, where we arrived at 2.40 p. m. of the same day. I called, that afternoon, at the West Point Foundery, and at the smelting-furnace of Brock & Co., and obtained permission for the cadets to inspect them. At the former, very little work of interest was at the time being done; but the cadets were shown over the foundery and saw some large blower-engines under construction, and also a breech-loading cannon composed of a cast-iron shell, with a steel cylinder forced in. At the smelting-furnace, however, much valuable information was obtained. They had a good opportunity to investigate thoroughly the process of smelting the ores and casting pig-iron of different qualities. The composition of the ores and fluxes used here was also explained to them. As this was the first opportunity the class had had to witness the reduction of the ore, I consider the visit was highly advantageous to them.

On August 15 we dropped down the river to West Point, and that afternoon I permitted all of the cadet-engineers to visit the Military Academy, and such as desired, to attend the cadets' hop that night.

On the 16th we returned to the Brooklyn navy-yard for a supply of coal.

On August 19 we sailed for Boston by way of Long Island Sound. The weather getting foggy, we sought a harbor on the morning of the 20th at Holmes's Hole, Martha's Vineyard, where we remained a day, and on the evening of the 21st of August we arrived at the Charlestown navy-yard. Here, every facility was given to us to accomplish the object of our visit. The cadet-engineers, under their instructors, visited all of the departments of the yard, examining the machinery and taking notes and drawings. Especial attention was given to the improved method here employed of fitting up compound-engine boilers; to the timber-bending machine; to the rope-walk, and to the extensive selection of tools. The cadets also visited the Franklin, where preparations were being made for the removal of her boilers, and their attention was directed to those parts which had suffered most from use and corrosion, with hints as to the care to be taken with them.

On Thursday, August 28, I called upon the proprietors of the Bay

State and the Norway Iron-Works, and obtained permission for the cadets to inspect them. The next day the entire class, with the instructors, visited these works, and had every facility extended for a thorough investigation. At the Norway Works, the method of making steel by the "cementation" process was seen, and all that could be learned concerning it duly noted. The manner of making coarse iron wire was also witnessed, and the machinery examined.

At the Bay State Works an opportunity was had for seeing the Siemen-Martin process of converting iron into steel, and tracings of the furnace obtained. The puddling of iron was likewise seen, and the process of refining and working into boiler-plates. These works, and the machinery, &c., at the navy-yard, comprised all that was considered of special interest at this place; and accordingly, on the afternoon of the 2d September, after having taken a supply of coal, &c., we sailed from Boston for the Washington navy-yard, where we arrived on the morning of September 7, having sought a harbor inside of Sandy Hook for twenty-four hours, in consequence of threatening weather.

We remained at the Washington navy-yard until September 26. That time was employed in visiting its various shops, attention being given principally to the cap and nail machines; to the fitting up of compound-engine cylinders; to the Rodman iron-testing machine; to the heavy anchor-forgings; to the copper-shops; and to the engines of the Gettysburg. Much of the machinery here seen was of the same type as that already inspected; but the instruction, as a review, was considered valuable. On September 22 and 23 the cadets were taken through the model-rooms of the United States Patent-Office, where they examined the models of the latest improvements in valve-gear; in piston-packing; in governors; in the various engines, rotary, direct-acting, and oscillating, and in paddle-wheels and screws, the cases being opened for the purpose.

We returned to the Naval Academy on the morning of September 27, and on the 29th the cadet-engineers were landed.

I take pleasure in stating that, throughout the cruise, the conduct of the cadets has been good, and their attention to duty commendable.

The instructors, Second Assistant Engineers R. Crawford and J. S. Ogden, were zealous in the performance of their duties.

I have the honor to be, admiral, very respectfully, your obedient servant,

ALEXANDER H. McCORMICK,
Lieutenant-Commander, Commanding.

Rear Admiral JOHN L. WORDEN, *U. S. N.*,
Superintendent United States Naval Academy.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1875, *by the Naval Academy.*

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1874.
NAVAL ACADEMY.		
Pay Naval Academy:		
Pay of professors and others:		
One professor of drawing, (head of department)	$2,500 00	
Four professors, viz: One of mathematics, (assistant,) one of chemistry, one of English studies, history, and law, and one of French, at $2,200 each, (appropriated, 17 Stat. at L., p. 153)	8,800 00	
Twelve assistant professors, viz: Four of French, one of Spanish, three of English studies, history, and law, one of mathematics, one of astronomy, and two of drawing, at $1,800 each, (appropriated, 17 Stat. at L., p. 153)	21,600 00	
Sword-master, at $1,500, and two assistants, at $1,000 each, (appropriated, 17 Stat. at L., p. 153)	3,500 00	
Boxing-master and gymnast, at $1,200, and assistant librarian, at $1,400, (appropriated, 17 Stat. at L., p. 153)	2,600 00	
Three clerks to Superintendent, at $1,200, $1,000, and $800 each, (appropriated, 17 Stat. at L., p. 153)	3,000 00	
One clerk to commandant of midshipmen, (appropriated, 17 Stat. at L., p. 153)	1,000 00	
One clerk to paymaster, (appropriated, 17 Stat. at L., p. 153)	1,000 00	
One apothecary, (appropriated, 17 Stat. at L., p. 153)	750 00	
One commissary, at $288; one cook, at $325.50; and messenger to Superintendent, at $600, (appropriated, 17 Stat. at L., p. 153)	1,213 50	
One armorer, at $529.50; gunner's mate, at $469.50; and quarter-gunner, at $409.50, (appropriated, 17 Stat. at L., p. 153)	1,408 50	
One coxswain, at $469.50; and three seamen in department of seamanship, at $349.50 each, (appropriated, 17 Stat. at L., p. 153)	1,518 00	
One band-master, at $528; and eighteen first-class musicians, at $348 each, (appropriated, 17 Stat. at L., p. 153)	6,792 00	
Seven second-class musicians, at $300 each; two drummers and one fifer, (first class,) at $348 each, (appropriated, 17 Stat. at L., p. 153)	3,144 00	
	58,826 00	$58,576 00
Estimate of appropriations required under head of pay of professors and others, for the fiscal year ending June 30, 1875	58,826 00	
Amount appropriated under head of pay of professors and others, for the fiscal year ending June 30, 1874	58,576 00	
Excess	250 00	
NOTE.—It will be seen that a change is proposed in this estimate, occasioned by the expediency of assigning a commissioned professor of mathematics in the Navy as the head of the department of mathematics, and of transferring the civil professor to the department of drawing, as its head, at the same salary, viz, $2,500 per annum, which he received as head of the department of mathematics, (authority, Navy Department, August 2, 1873;) also, that this estimate is $250 in excess of that of last year, and is occasioned by an increase of pay recommended for the sword-master, whose present compensation is inadequate to the support of his family, and by no means commensurate with the service he renders.		
Pay of watchmen and others:		
Captain of the watch, at $2.50 per diem	912 50	
Four watchmen, at $2.25 per diem each	3,285 00	
Foreman of the gas and steam-heating works, at $5 per diem	1,825 00	
Twelve attendants at gas and steam-heating works of Academy, at new quarters for cadet-midshipmen and at school-ships—one at $3.50, three at $3, and eight at $2.50 per diem each	11,862 00	
Three joiners, two painters, and two masons, at $3.50 per diem each	8,942 50	
One tinner, one gas-fitter, and one blacksmith, at $3.50 per diem each	3,832 50	
	30,659 50	30,659 50
Pay of mechanics and others:		
One mechanic at workshop, at $2.25 per diem	821 25	
One master laborer to keep public grounds in order, at $2.28 per diem	832 20	
Fourteen laborers to assist in same, three at $2 per diem each, and eleven at $1.75 per diem each	9,216 25	
One laborer to superintend quarters of cadet-midshipmen, public grounds, &c., at $2.28 per diem	832 20	
Four attendants at recitation-rooms, library, chapel, and offices, at $20 per month each	960 00	
Twenty servants to keep in order and attend to quarters of cadet-midshipmen, public buildings, &c., at $20 per month each	4,800 00	
	17,461 90	17,461 90

Estimates of appropriations required by the Naval Academy, &c.—Continued.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1874.
Pay in department of steam-enginery:		
One machinist, at $3.50 per diem	$1,277 50	
One machinist, at $3 per diem	1,095 00	
One blacksmith, at $3.50 per diem	1,277 50	
One boiler-maker, at $3.50 per diem	1,277 50	
One pattern-maker, at $3.50 per diem	1,277 50	
One molder, at $3.50 per diem	1,277 50	
Two laborers, at $1.75 per diem each	1,277 50	
	8,760 00	$8,760 00
Repairs and improvements at Naval Academy:		
For the necessary repairs and improvements of public buildings, for furniture and fixtures, for renewing pavements, and for repairing wharves and walls inclosing the grounds of the Academy	14,000 00	14,000 00
Contingent expenses, Naval Academy:		
For materials for heating and lighting the Academy, and school-ship quarters	19,000 00	
For the purchase of books for the library	2,000 00	
For stationery, blank-books, models, maps, &c., and for text-books for use of instructors	2,000 00	
For expenses of the Board of Visitors	2,000 00	
For printing and binding	2,000 00	
For postage on public service	*750 00	
For expenses in the astronomical and philosophical departments	800 00	
For the purchase of gas and steam machinery, steam-pipe and fixtures, rent of buildings for use of the Academy, freight, cartage, water, music and musical instruments, uniforms for bandsmen, telegraphing, and for the current expenses and repairs of all kinds, and for incidental labor and expenses not applicable to any other appropriation	34,000 00	
For stores in the department of steam-enginery	800 00	
For material for repairs of steam-machinery	1,000 00	
	64,350 00	64,000 00
RECAPITULATION.		
Pay of professor and others	58,826 00	
Pay of watchmen and others	30,659 50	
Pay of mechanics and others	17,461 90	
Pay in department of steam-enginery	8,760 00	
Repairs and improvements	14,000 00	
Contingent expenses	64,350 00	
	194,057 40	193,457 40

* Excess of $3.50 in this estimate is made necessary by the repeal of the franking privilege.

Respectfully submitted.

JOHN L. WORDEN,
Rear-Admiral United States Navy, and Superintendent Naval Academy.

UNITED STATES NAVAL ACADEMY, *September* 1, 1873.

No. 3.

BUREAU OF EQUIPMENT AND RECRUITING.

NAVY DEPARTMENT,
BUREAU OF EQUIPMENT AND RECRUITING,
Washington, October 25, 1873.

SIR: I have the honor to submit herewith the annual report of the operations of this bureau, together with the estimates for the fiscal year ending June 30, 1875.

During the past fiscal year 75 vessels have been either partially or

wholly equipped at the several navy-yards, at an expenditure, including labor and material, of $832,794.54.

Thirty-seven thousand four hundred forty-five and one-fourth tons of coal have been purchased, at home and abroad, at a cost of $400,071.76, and 200⅖ tons of manila hemp have been purchased, costing $72,832.50.

The rope-walk at the Charlestown navy-yard has supplied the wants of the service with hemp and manila rope; 304¾ tons of hemp of both kinds have been manufactured into rope. The bureau expects soon to have the wire-rope machinery in operation, for the manufacture of wire rope.

The equipment-shops at the Washington navy-yard have supplied all the wants of the service for anchors, chains, galleys, &c.

The complement of men allowed (8,500) has not been exceeded within the year. During the summer enlistments fell off and reduced the number of men on hand to 7,500. At present recruiting is more active, and the complement is filling up.

Every year's experience in enlisting men for the naval service makes the difficulty of procuring men the more apparent, and the necessity of providing by law for the establishment of a system of apprenticeship adapted to the wants of the Navy more and more requisite.

The former recommendations of the bureau as to furnishing enlisted men with an outfit on entering the service, and as to apprehending deserters after the time of their enlistment has expired, and causing them to serve out their lost time, as is the case in the Army, are respectively renewed.

I have the honor to be, very respectfully, your obedient servant,

WM. REYNOLDS,
Chief of Bureau.

HON. GEO. M. ROBESON,
Secretary of the Navy.

E. & R. No. 1.

Estimate of the amount required for the support of the Bureau of Equipment and Recruiting for the fiscal year ending June 30, 1875.

For salary of chief clerk, (act July 5, 1862)	$1,800
For salary of one fourth-class clerk, (act July 23, 1866)	1,800
For salary of one third-class clerk, (act of July 23, 1866)	1,600
For salary of two second-class clerks, (act July 12, 1870)	2,800
For salary of two first-class clerks, (act July 23, 1866)	2,400
For salary of one messenger, (act March, 1867)	840
For salary of one laborer, (act July 12, 1870)	720
	11,960
For contingent expenses, stationery, books, and miscellaneous items	800
	12,760
Appropriated for the fiscal year ending June 30, 1874	12,710

E. & R. No. 2.

Estimate of the amount required for the purchase of materials, articles, &c., for the equipment of vessels in the Navy for the fiscal year ending June 30, 1875.

For the purchase of various articles of equipment, viz, coal for steamers' use and fuel for ship's use, including expenses of transportation, storage, labor, hemp, wire, and other materials for the manufacture of rope, hides, cordage, canvas, leather, iron for manufacture of cables, anchors, and galleys, condensing and boat-detaching apparatus, furniture, hose, bake-ovens and cooking-stoves, life-rafts, heating-apparatus for receiving-ships, and for the payment of labor in equipping vessels and manufacture of articles in the navy-yards pertaining to this bureau	$1,500,000
Appropriated for the fiscal year ending June 30, 1874	1,500,000

E. & R. No. 3.

Estimate for pay for the fiscal year ending June 30, 1875.

For pay of commissioned and warrant officers at sea, on shore, on special service, and those on the retired list and unemployed, and for mileage or transportation of officers traveling under orders, and for pay of the petty officers, seamen, ordinary seamen, landsmen, and boys, including men for the engineers' force and for the Coast Survey service, 8,500 men, at an average pay of $300 per annum	$6,500,000
Appropriated for the fiscal year ending June 30, 1874	6,250,000

E. & R. No. 4.

Estimate of the amount required for the pay of civil officers under the cognizance of the Bureau of Equipment and Recruiting for the fiscal year ending June 30, 1875.

PORTSMOUTH, N. H.		
Clerk in equipment office	$1,400	
Store clerk, $1,100; time clerk, $900	2,000	
BOSTON.		
Superintendent of rope-walk	1,900	
Clerk to same	1,200	
Clerk in equipment office	1,500	
One time and one store clerk, $1,200 each	2,400	
PHILADELPHIA.		
Clerk in equipment office	1,400	
One time and one store clerk, $1,200 each	2,400	
WASHINGTON.		
Clerk in equipment office	1,500	
One store clerk, $1,400; one time clerk, $1,200	2,600	
BROOKLYN, N. Y.		
Clerk in equipment office	1,500	
One store and one time clerk, $1,200 each	2,400	
PENSACOLA.		
Clerk in equipment office	1,300	
NORFOLK.		
Clerk in equipment office	1,400	
Store clerk, $1,125; time clerk, $900	2,025	
MARE ISLAND, CAL.		
Clerk in equipment office	1,875	
One store clerk	1,200	
		$30,000
Appropriation for the fiscal year ending June 30, 1874		30,000

E. & R. No. 5.

Estimate of the amount required for contingent expenses of the Bureau of Equipment and Recruiting for the fiscal year ending June 30, 1875.

For expenses that may accrue for the following purposes, viz: Contingent expenses of Bureau of Equipment and Recruiting, for recruiting; freight and transportation of stores; transportation of enlisted men; expenses of auction sales; advertising; telegraphing; books and models; stationery; express charges; internal alterations and fixtures in equipment buildings at navy-yards; foreign postage; ferriages and car-tickets; ice; apprehension of deserters; assistance to vessels in distress, and good-conduct badges for enlisted men	$125,000
Appropriated for the fiscal year ending June 30, 1874	125,000

E. & R. No. 6.

Estimate of the amount required for public printing under Bureau of Equipment and Recruiting for the fiscal year ending June 30, 1875	$6,000

RECAPITULATION.

For salaries	11,960
For contingent	800
	12,760

NAVAL SERVICE.

Equipment of vessels	$1,500,000
Pay of the Navy	6,500,000
Pay of civil employés	30,000
Contingent, equipment, and recruiting	125,000
Public printing	6,000
	8,161,000

E. & R. No. —.

Abstract of offers for supplies (embracing as well those which are rejected as those which are accepted) received for furnishing articles coming under the cognizance of the Bureau of Equipment and Recruiting, made in conformity to the act of Congress approved March 3, 1843, *under advertisement of May* 26, 1873.

FOR THE NAVY-YARD AT KITTERY, ME.

Class No. 3. Cotton hammock, bag and cot stuff:	
George H. Creed	*$1,560 00
Brinckerhoff, Turner & Co	1,700 00
Class No. 8. Hardware:	
David Babcock & Co	*138 55
G. H. Creed	174 60
Hyatt & Spencer	145 74
Class No. 15. Brushes:	
D. Babcock & Co	*36 00
G. H. Creed	61 00
Hyatt & Spencer	38 46
Class No. 16. Ship-chandlery:	
D. Babcock & Co	$281 10
G. H. Creed	*241 50
Hyatt & Spencer	280 50
Class No. 18. Stationery:	
A. S. Barnes & Co	166 75
James H. Foster	120 56
W. H. Dempsey	*117 20
Class No. 19. Dry-goods:	
D. Babcock & Co	232 50
G. H. Creed	*159 00
Hyatt & Spencer	244 75
Class No. 22. Paints and oils:	
D. Babcock & Co	261 75
G. H. Creed	*243 80
Hyatt & Spencer	261 30

*Accepted.

FOR THE NAVY-YARD AT CHARLESTOWN, MASS.

Class No. 3. Cotton hammock, bag and cot stuff:	
George H. Creed	*$3,370 00
Brinckerhoff, Turner & Co	3,900 00
Class No. 8. Hardware:	
George H. Creed	128 30
Hyatt & Spencer	128 11
D. Babcock & Co	*99 08
Class No. 12. Leather:	
G. H. Creed	*410 00
Hyatt & Spencer	†402 20
D. Babcock & Co	477 20
Walton Brothers	435 20
Class No. 14. Ox-hides for rope:	
George H. Creed	*13,800 00
Hyatt & Spencer	14,925 00
D. Babcock & Co	$16,500 00
Walton Brothers	16,875 00
Class No. 17. Tar and tar-oils:	
George H. Creed	*2,588 00
Hyatt & Spencer	3,033 00
D. Babcock & Co	2,888 00
Class No. 18. Stationery:	
A. S. Barnes & Co	136 50
William H. Dempsey	*121 90
Class No. 22. Paints and oils:	
G. H. Creed	1,025 30
Hyatt & Spencer	1,069 46
D. Babcock & Co	1,278 05

FOR THE NAVY-YARD AT WASHINGTON, D. C.

Class No. 4. Iron and steel:	
George H. Creed	*$64 75
D. Babcock & Co	85 40
Hyatt & Spencer	76 12
Class No. 5. Galley-iron:	
D. Babcock & Co	*417 50
George H. Creed	600 00
Hyatt & Spencer	565 00
Class No. 6. Pig-iron:	
D. Babcock & Co	1,312 50
G. H. Creed	*1,237 50
Class No. 7. Chain-iron:	
D. Babcock & Co	1,862 50
G. H. Creed	*1,513 87
Hyatt & Spencer	†1,428 25
Class No. 8. Hardware:	
D. Babcock & Co	*126 04
G. H. Creed	142 50
Hyatt & Spencer	†123 54
Class No. 10. Tools:	
Hyatt & Spencer	†377 83
Class No. 12. Leather:	
D. Babcock & Co	$260 50
G. H. Creed	*202 60
Hyatt & Spencer	206 97
Class No. 15. Brushes:	
D. Babcock & Co	*54 00
G. H. Creed	60 00
Hyatt & Spencer	†43 80
Class No. 16. Ship-chandlery:	
D. Babcock & Co	193 20
G. H. Creed	*149 10
Hyatt & Spencer	161 34
Class No. 17. Tar and tar-oils:	
D. Babcock & Co	*145 25
G. H. Creed	253 50
Hyatt & Spencer	149 00
Class No. 18. Stationery:	
A. S. Barnes & Co	44 30
William H. Dempsey	*39 45

FOR THE NAVY-YARD AT BROOKLYN, N. Y.

Class No. 8. Hardware:	
G. H. Creed	*$482 00
D. Babcock & Co	894 60
Hyatt & Spencer	515 25
Class No. 16. Ship-chandlery:	
G. H. Creed	*308 15
D. Babcock & Co	403 17
Hyatt & Spencer	†307 75
Class No. 18. Stationery:	
A. S. Barnes & Co	$273 80
William H. Dempsey	*236 80
Class No. 20. Fire-wood:	
D. Babcock & Co	*280 00
Class No. 22. Paints and oils:	
G. H. Creed	*404 60
D. Babcock & Co	700 65
Hyatt & Spencer	473 67

* Accepted.

† Rejected.

FOR THE NAVY-YARD AT PHILADELPHIA.

Class No. 8. Hardware:

Hyatt & Spencer	$171 25
D. Babcock & Co	*142 05
Paul J. Field	203 50
George H. Creed	168 50

Class No. 18. Stationery:

A. S. Barnes & Co	54 34
Paul J. Field	$58 94
William H. Dempsey	*34 83

Class No. 16. Ship-chandlery:

Hyatt & Spencer	†397 25
D. Babcock & Co	*456 40
P. J. Field	772 75
George H. Creed	482 40

FOR THE NAVY-YARD AT NORFOLK, VA.

Class No. 3. Cotton hammock, bag and cot stuff:

George H. Creed	*$2,645 00
Brinckerhoff, Turner & Co	2,850 00
Brinckerhoff, Turner & Co	3,562 50
Staples, Peed & Co	3,250 00

Class No. 4. Iron and steel:

D. Babcock & Co	19 00
Hyatt & Spencer	22 75
George H. Creed	*14 00

Class No. 8. Hardware:

D. Babcock & Co	*243 00
Hyatt & Spencer	†236 65
George H. Creed	294 70

Class No. 9. Cooking-utensils:

D. Babcock & Co	*178 56
Hyatt & Spencer	187 56
George H. Creed	211 80

Class No. 12. Leather:

D. Babcock & Co	95 20
Hyatt & Spencer	†73 78
G. H. Creed	*88 06

Class No. 15. Brushes:

D. Babcock & Co	28 40
Hyatt & Spencer	21 25
George H. Creed	*17 80

Class No. 16. Ship-chandlery:

D. Babcock & Co	$343 80
Hyatt & Spencer	317 23
George H. Creed	*301 58
Staples, Peed & Co	444 50

Class No. 17. Tar and tar-oils:

William A. Wood	208 12
D. Babcock & Co	220 00
Hyatt & Spencer	217 25
G. H. Creed	*184 80
Staples, Peed & Co	662 20

Class No. 18. Stationery:

A. S. Barnes & Co	167 30
William H. Dempsey	*76 82

Class No. 19. Dry-goods:

D. Babcock & Co	185 40
Hyatt & Spencer	189 94
G. H. Creed	183 80

Class No. 20. Fire-wood:

D. Babcock & Co	*325 00

Class No. 22. Fire-wood:

Wertzner, Shieve & Willey	228 05
D. Babcock & Co	*188 70
Hyatt & Spencer	199 11
G. H. Creed	193 33
Staples, Peed & Co	230 40

* Accepted.

† Rejected.

No. 4.

BUREAU OF YARDS AND DOCKS.

BUREAU OF YARDS AND DOCKS, NAVY DEPARTMENT,
Washington, D. C., November 13, 1873.

SIR: I have the honor to submit the annual report of the Bureau of Yards and Docks, with estimates for improvements, repairs, and contingent expenses for the next fiscal year.

I beg leave to renew the recommendations offered in my last annual report, and especially to urge caution should an effort be made to alienate a portion of the navy-yard at New York. It is our most valuable navy-yard, admirably placed, and our great resource in time of war. Its marsh-lands are being rapidly filled up, without cost to the Government, by private persons using them as a dumping-ground for the earth taken from the excavations of the city, and I trust that no heed may be given to the speculators who approach Congress with specious recommendations, hoping to make their profit out of the sale of land invaluable to the Navy.

At Philadelphia, in obedience to the will of Congress, a large quantity of material has been removed from the old navy-yard to the new one at League Island; the cannon, the shot and shells, the anchors and chain-cables, and a portion of the timber, are already transferred; the foundation of the great iron-plating shop for construction is in progress, and the large and carefully-built store-house, workshop, and machine-shop for yards and docks are nearly completed.

An area equal to that of the old navy-yard has been filled and raised to the permanent grade adopted for the new yard.

No difficulty is found in securing a perfectly solid foundation for the new buildings at a moderate cost, and if Congress will have the old yard carefully valued, and appropriate a sum equal to this value to be expended in renewing on League Island the present establishment at Philadelphia, the old yard might soon be abandoned to its purchasers and the Treasury re-imbursed for the money advanced.

Since my last annual report I have carefully examined the navy-yard at Mare Island, and I beg to renew the statements and recommendations I made in my report of last year.

It is of especial importance that liberal appropriation should be made for the quay-wall on the water-front, not only to afford ample wharf-room for our ships, but to prevent the filling of the channel by mud.

A clear, unbroken quay-wall, carefully placed, will cause the tide to scour the navy-yard front, and thus prevent the deposit of earth now so fruitful of mischief and expense.

The system of hydraulic mining prevalent in California has loaded the rivers with earth, and has greatly increased the mud-deposit on our water-front.

The excavation of the dry-dock has been nearly completed, and the laying of masonry is about to begin.

A board of civil engineers is now in session at Mare Island, studying the most economical and best plan for developing and improving the resources of this admirable site for our great Pacific navy-yard.

In February last a board, of which Rear-Admiral John Rodgers was the senior member, made a careful examination of the navy-yard at Pensacola, and strongly recommended that some of the buildings destroyed during the war should be rebuilt, and that the navy-yard should

not be removed from its old site. This yard would be of great importance in the event of our needing a large squadron in the Gulf of Mexico or West Indies, and I concur in the recommendations of the board, and respectfully urge that a liberal appropriation be made to put the navy-yard in good working order as a second-class yard.

A proper naval prison at one of our navy-yards is greatly needed. Our sailors and marines under sentence of courts-martial are crowded into cells at the marine barracks in a manner contrary to the humane spirit of the age, and ruinous to that hope of reform which well-regulated prisons encourage. Two men are of necessity placed iu a cell not large enough for one, badly ventilated and drained, and generally insecure. Such confinement produces indecency and vicious habits, and I cannot too strougly urge an ample appropriation to remedy such a crying evil.

Our prisoners now pass their time in wretched idleness, but, under a better system, their labor would provide for their support, and perhaps lead to reformation. Lieutenant-Colonel Broome, of the Marines, has, under the direction of this bureau, examined the prisons of the Northern States, and has carefully and intelligently stated the need of the Navy in this particular, and the best method of meeting it. His excellent report is already in your hands.

KITTERY, ME.

At this navy-yard there has been expended under the appropriation, "navy-yard, Kittery, Me.," during the fiscal year ending 30th June, 1873, for materials, $45,520.66, and for labor $118,862.66, making an aggregate of $164,383.32. A large portion of this expenditure has been for very extensive repairs to the floating-dock, and in building a bridge between the navy-yard proper and Seavey's Island; the balance for the repairs of the various buildings, docks, roads, &c. Under head of "emergencies at naval stations" there has been expended $1,000. The amount expended under the appropriation "civil establishment" is $9,424.50. For various objects coming under the head of "contingent," has been expended the sum of $98,558.76.

Estimates are submitted for the fiscal year ending 30th June, 1875, for navy-yard, Kittery, Me., $103,000, for the following objects: For repairs of all kinds; for civil establishment, navy-yard, Kittery, Me., $9,100.

CHARLESTOWN, MASS.

The amount expended at this yard under the appropriation, "navy-yard, Charlestown, Mass.," during the fiscal year ending 30th June, 1873, is for materials, $32,428.12, and for labor $47,383.59, making an aggregate of $79,811.71, all of which has been expended in making the necessary repairs to the various buildings, offices, docks, wharves, roads, fences, &c. Under the head of "emergencies at naval stations," there has been expended the sum of $4,215.07. The amount expended under the appropriation for "civil establishment," is $12,239.40, and for various items under head of "contingent," is $139,144.97.

Estimates are submitted for the fiscal year ending 30th June, 1875, for navy-yard, Charlestown, $137,500., for the following objects, viz: Repairs of all kinds; for civil establishment, navy-yard, Charlestown, Mass., $11,900.

BROOKLYN, N. Y.

The amount expended at this yard under the appropriation "navy-yard, Brooklyn," during the past fiscal year is, for materials $16,435.99,

and for labor $109,108.18, making in the aggregate the sum of $125,544.17. Under the head of "emergencies at naval stations," there has been expended for materials, $372.95, and for labor $2,654.10, making an aggregate of $3,027.05. The amount expended under head of "civil establishment," is $12,074.90, and under the various items coming under the head of "contingent," is $170,382.21.

Estimates are submitted for the fiscal year ending 30th June, 1875, for navy-yard, Brooklyn, $152,000, for the following objects, viz: Repairs of all kinds; for civil establishment, navy-yard, Brooklyn, N. Y., $12,800.

PHILADELPHIA, PA.

The amount expended at this yard during the fiscal year ending June 30, 1873, under appropriation "navy-yard, Philadelphia," is for materials $11,888.42, and for labor $30,868.80, amounting in the aggregate to $42,757.22, all of which has been for current repairs and for dredging channels. The amount expended under head of "civil establishment" is $8,756.22, and for the various items coming under the head of "contingent," $72,813.27.

Estimates are submitted for the fiscal year ending June 30, 1875, for navy-yard, Philadelphia, $78,000, for repairs of all kinds; for civil establishment, navy-yard, Philadelphia, Pa., $11,100.

WASHINGTON, D. C.

There has been expended at this yard under the appropriation "navy-yard, Washington," during the fiscal year ending June 30, 1873, for materials $13,681.70, and for labor $61,256.76, making an aggregate of $74,938.46, all of which has been for repairs of the various buildings, docks, &c. Under the head of "emergencies at naval stations" there has been expended the sum of $1,000. The amount expended under head of "civil establishment" is $10,200, and under "appropriation contingent," $94,065.56.

Estimates are submitted for the fiscal year ending June 30, 1875, for navy-yard, Washington $100,000, for the following objects viz: For repairs of all kinds; for civil establishment, navy-yard at Washington, D. C., $10,100.

NORFOLK, VA.

The amount expended during the fiscal year ending June 30, 1873, under the head of "navy-yard, Norfolk," is for materials $23,245.65, and for labor $74.884, making an aggregate of $98,129.65, all of which has been expended for current repairs of the various buildings, docks, wharves, &c. Under the head of "emergencies at naval stations" there has been expended $3,220.76. The amount expended under the head of "civil establishment" is $6,586.69, and for the various items coming under the head of "contingent" $101,384.89.

Estimates are submitted for the fiscal year ending June 30, 1875, for navy-yard, Norfolk, $85,683.77; for the following objects, viz: For repairs of all kinds; for civil establishment, navy-yard at Norfolk, Va., $12,000.

PENSACOLA, FLA.

The amount expended under the appropriation, "navy-yard, Pensacola," during the fiscal year ending 30th June, 1873, is for materials

$11,839.16, and for labor $28,364.26, making an aggregate of $40,203.42. Under the head of "emergencies at naval stations" there has been expended for materials, $8,488.21, and for labor, $3,699.08, making an aggregate of $12,187.29. The amount expended under the head of "civil establishment" is $4,459.45, and for objects coming under the head of "contingent" $42,517.47.

Estimates are submitted for the fiscal year ending 30th June, 1875, for navy-yard, Pensacola, $83,305.51, for the following objects, viz: For repairs of all kinds; for civil establishment, navy-yard, Pensacola, Fla., $6,600.

MARE ISLAND, CAL.

There has been expended at this yard during the past year, under head of "navy-yard, Mare Island," for materials $123,802.05, and for labor $222,433.36, making an aggregate of $346,235.41. The principal part of these expenditures were upon the repairs of the floating dry-dock and upon the construction of the new excavated stone dry-dock. Under the appropriation "emergencies at naval stations," there was expended the sum of $643.25. The amount expended under appropriation for "civil establishment" is $8,358.59, and for the various objects coming under "contingent" $98,029.21.

Estimates are submitted for the fiscal year ending 30th June, 1875, for navy-yard, Mare Island, $101,100, for the following objects, viz: For repairs of all kinds; for civil establishment, navy-yard at Mare Island, Cal., $10,500.

SACKETT'S HARBOR.

There having been no special appropriation for this station, the amount necessary for the preservation of the public property, amounting to $1,003.74, has been paid from the appropriation "contingent" during the past fiscal year.

Estimates are submitted for the fiscal year ending 30th June, 1875, for protection and preservation of public property, $2,000.

MOUND CITY, ILL.

There being no appropriation for improvements at this station, and certain repairs to the buildings and levee becoming indispensable, the work has been done under the appropriation "emergencies at naval stations." The amount expended is for materials $984, and for labor $476, making an aggregate of $1,460. The amount paid under head of "contingent" is $12,380.91.

Estimates are submitted for the fiscal year ending 30th June, 1875, for protection and preservation of public property, $2,000.

NEW LONDON, CONN.

The amount expended at this station, under appropriation "naval station, New London," is for materials $495.15, and for labor $19,504.85, making an aggregate of $20,000. The amount expended under the head of "contingent" is $5,922.78.

Estimates are submitted for the fiscal year ending June 30, 1875, for the protection and preservation of the public property, $10,000.

LEAGUE ISLAND, PA.

The amount expended under the appropriation, "naval station, League Island," during the fiscal year ending 30th June, 1873, is for materials $161,440.62, and for labor $24,191.77, making an aggregate of $185,632,39. Under the appropriation for "emergencies at naval stations" there has been expended $999.70. The amount expended under head of "civil establishment" is $5,800.02, and under appropriation "contingent," $41,986.65.

Estimates are submitted for the fiscal year ending 30th June, 1875, for repairs of all kinds; for civil establishment, navy-yard, League Island, Pa., $7,800.

KEY WEST, FLA.

There has been expended under the appropriation, "naval station, Key West," during the fiscal year ending 30th June, 1873, for materials $2,136.74, and for labor $13,275.12, making an aggregate of $15,411.86. These expenditures have been made upon the foundry, and repairs upon other buildings, wharves, &c. For objects coming under the head of "contingent" there has been expended $1,284.73.

Estimates are submitted for the fiscal year ending 30th June, 1875, for repairs of all kinds, $5,000.

NEW ORLEANS, LA.

There being no special appropriatian for this station, and repairs being necessary to the levee, during the past year, the sum of $210 was expended for this purpose, under the head of "emergencies." There has been expended under the head of "contingent," $53.60.

Estimates are submitted for the fiscal year ending 30th June, 1875, for repairs of all kinds, $5,000.

NAVAL ASYLUM.

On the 1st July, 1872, there were 161 persons, including officers and attendants, borne on the rolls of the asylum. During the fiscal year ending 30th June, 1873, 12 beneficiaries have been admitted, 9 have died, and 2 honorably discharged.

The expenses of the institution for the support of the beneficiaries, pay of officers and attendants, and for miscellaneous repairs, during the past fiscal year, are, viz:

For subsistence	$17,014 40¼
For clothing, tobacco, &c	11,513 38½
For miscellaneous items	10,816 28
For officers and attendants	26,151 29
	65,495 35¾

The total amount estimated for the support of the institution during the fiscal year ending 30th June, 1875, for the annual repairs of buildings, improvement of cemetery, support of beneficiaries, and pay of officers and attendants, is $69,307, which, by law, is paid out of the naval-pension fund.

EMERGENCIES AT NAVAL STATIONS.

Under this appropriation, as hereinbefore stated, there has been expended at the several navy-yards and stations, during the fiscal year ending 30th June, 1873, the sum of $27,963.12. These expenditures were made at Kittery, Charlestown, Brooklyn, Washington, Norfolk, Pensacola, Mare Island, League Island, Mound City, and New Orleans, for objects of pressing necessity, and for which no special appropriation had been made.

Estimates are submitted for the fiscal year ending 30th June, 1875, for "contingent at naval stations," which is the title given by Congress to this appropriation, for the sum of $50,000.

"GENERAL MAINTENANCE OF YARDS AND DOCKS."

The objects coming under this head were formerly estimated for under the head of "contingent," but at the last session of Congress the heading was changed to the present more appropriate one.

The amount expended at the several navy-yards and stations, under the head of "contingent," during the fiscal year ending the 30th June, 1873, is $879,528.75.

Estimates are submitted for the fiscal year ending 30th June, 1875, for necessary expenses for the same objects, but coming under the head of "general maintenance of yards and docks," amounting to $860,000.

I am, sir, very respectfully, your obedient servant,

C. R. P. RODGERS,
Chief of Bureau.

Hon. GEO. M. ROBESON,
Secretary of the Navy, Washington, D. C.

ABSTRACT OF OFFERS FOR SUPPLIES (EMBRACING AS WELL THOSE WHICH ARE REJECTED AS THOSE WHICH ARE ACCEPTED) RECEIVED FOR FURNISHING ARTICLES COMING UNDER THE COGNIZANCE OF THE BUREAU OF YARDS AND DOCKS, MADE IN CONFORMITY TO THE ACT OF CONGRESS APPROVED MARCH 3, 1843.

Offers for supplies for the navy-yard at Portsmouth, N. H., under advertisement dated May 14, 1873.

Class No. 6. White pine, spruce, juniper and cypress:	
G. A. Hammond	$5,010 45
Trickey & Jewett	*4,975 10
Samuel Adams & Co	6,638 50
Class No. 7. Lime, hair, and plaster:	
Hyatt & Spencer	†215 00
D. Babcock & Co	* 135 00
Jos. L. Savage	199 00
Trickey & Jewett	200 00
Samuel Adams & Co	145 00
Class No. 11. Iron, iron spikes, and nails:	
Hyatt & Spencer	†5,419 00
D. Babcock & Co	*4,262 00
Jos. L. Savage	*$4,288 00
Class No. 14. Files:	
Hyatt & Spencer	†309 22
Jas. L. Parker	* 333 00
Jos. L. Savage	293 90
Class No. 15. Paints, oils, and glass:	
Hyatt & Spencer	† 998 65
Jas. L. Parker	* 1,047 00
Wood, Sharp & Haines	†1,026 00
D. Babcock & Co	1,236 25
Jos. L. Savage	1,054 00
Class No. 18. Stationery:	
Wm. H. Dempsey	* 249 75
Frost & Adams	312 44
A. S. Barnes & Co	387 32

* Accepted.

† Rejected.

Jos. H. Foster	$257 31
Wm. Ballantyne	280 65
Class No. 20. Hay and straw:	
G. A. Hammond	*2,190 00
Jos. L. Savage	4,900 00
Trickey & Jewett	2,800 00
Class No. 21. Provender:	
Jos. L. Savage	2,703 50
Trickey & Jewett	*2,657 50
Class No. 22. Charcoal:	
Chas. G. Brown	$290 00
D. Babcock & Co	*250 00
Class No. 24. Sperm and lubricating oils:	
Hyatt & Spencer	†175 00
Jas. L. Parker	167 00
D. Babcock & Co	184 00
Jos. L. Savage	*‡167 00

Offers for supplies for the navy-yard at Charlestown, Mass., under advertisement dated May 14, 1873.

Class No. 1. Bricks:	
Trickey & Jewett	$2,400 00
Hugh Kelley	1,820 00
Jos. L. Savage	1,895 00
D. Babcock & Co	1,950 00
John Turner	*1,650 00
Class No. 2. Stone:	
Jos. L. Savage	*137 00
D. Babcock & Co	210 00
John Turner	219 00
Class No. 5. Oak and hard-wood:	
Trickey & Jewett	*950 00
Jos. W. Duryea	980 00
Class No. 6. White pine, spruce, and juniper:	
Trickey & Jewett	*8,350 00
Jos. W. Duryea	8,400 00
Class No. 7. Lime, hair, and plaster:	
Trickey & Jewett	350 00
S. H. Fall	290 00
Hyatt & Spencer	†400 00
Hugh Kelley	294 00
Jos. L. Savage	398 00
D. Babcock & Co	*250 00
John Turner	290 00
Class No. 8. Cement:	
Trickey & Jewett	500 00
S. H. Fall	500 00
Hyatt & Spencer	†430 00
Hugh Kelley	530 00
Jos. L. Savage	400 00
D. Babcock & Co	*‡400 00
John Turner	440 00
Class No. 9. Gravel and sand:	
S. H. Fall	1,430 00
Hugh Kelley	$1,405 00
D. Babcock & Co	1,400 00
John Turner	*1,275 00
Ezra Eames	1,525 00
Class No. 11. Iron, iron spikes, and nails:	
Hyatt & Spencer	†1,900 50
Jos. L. Savage	1,863 40
Loring, Wales Bros	2,088 70
Geo. H. Creed	*1,705 15
D. Babcock & Co	2,173 80
Class No. 12. Steel:	
Hyatt & Spencer	†267 27
Jos. L. Savage	257 92
Loring, Wales Bros	325 18
Geo. H. Creed	*243 92
Class No. 15. Painsts, oils, and glass:	
Hyatt & Spencer	†1,842 16
Jos. L. Savage	1,793 90
Geo. H. Creed	*1,649 50
D. Babcock & Co	1,783 00
Wood, Sharp & Haines	1,992 75
Class No. 16. Ship-chandlery:	
Hyatt & Spencer	†1,833 74
Jos. L. Savage	*1,300 65
Geo. H. Creed	1,633 42
D. Babcock & Co	1,939 14
Class No. 17. Hardware:	
Hyatt & Spencer	†2,899 31
Jos. L. Savage	2,872 80
Geo. H. Creed	*2,808 90
Class No. 18. Stationery:	
Frost & Adams	787 57
Wm. H. Dempsey	*601 56
Wm. Ballantyne	653 35
A. G. Barnes & Co	905 07
J. M. Whittimore	715 30

* Accepted. † Rejected. ‡ Decided by lot.

Class No. 20. Hay and straw:

Trickey & Jewett	*$4,100 00
S. H. Fall	4,175 00
John Mullett	4,151 25
Jos. L. Savage	6,525 00

Class No. 21. Provender:

Trickey & Jewett	2,985 00
John Mullett	*2,474 00
Jos. L. Savage	4,159 00

Class No. 22. Charcoal:

John Mullett	*105 00
D. Babcock & Co	125 00

Class No. 23. Belting, packing, and hose:

Hyatt & Spencer	†782 80
Joseph L. Savage	$772 90
George H. Creed	*746 40
D. Babcock & Co	923 30

Class No. 24. Sperm and lubricating oils:

Hyatt & Spencer	†360 95
John Mullett	357 75
Joseph L. Savage	358 45
George H. Creed	*325 90
D. Babcock & Co	396 55

Class No. 25. Iron-work, piping, &c.:

Hyatt & Spencer	†3,019 21
Joseph L. Savage	3,566 60
George H. Creed	*3,262 00

Offers for supplies for the navy-yard at Brooklyn, N. Y., under advertisement dated May 14, 1873.

Class No. 1. Bricks:

Joseph L. Savage	$480 00
D. Babcock & Co	*450 00
Watson & Pittinger	537 50
Hawkins & Henkens	†450 00
S. P. Brown	925 00

Class No. 3. Yellow-pine timber:

Trickey & Jewett	1,415 00
Watson & Pittinger	1,536 00
J. Bigler & Co	*1,329 00
S. P. Brown	1,857 50

Class No. 5. Oak and hardwood:

Trickey & Jewett	897 50
Watson & Pittinger	1,183 00
J. Bigler & Co	886 00
S. P. Brown	*825 00

Class No. 6. White, spruce, juniper, and cypress:

Trickey & Jewett	5,677 50
Watson & Pittinger	*4,235 00
J. Bigler & Co	5,070 00
Joseph W. Duryea	4,343 50
S. P. Brown	6,920 00

Class No. 7. Lime, hair, and plaster:

Joseph L. Savage	*137 00
D. Babcock & Co	175 00
Watson & Pittinger	205 00
Hyatt & Spencer	†198 00
Hawkins & Henkens	138 00

Class No. 8. Cement:

Joseph L. Savage	$210 00
D. Babcock & Co	*180 00
Watson & Pittinger	240 00
Hyatt & Spencer	†195 00
Hawkins & Henkens	185 00

Class No. 9. Gravel and sand:

Joseph L. Savage	224 00
D. Babcock & Co	*220 00

Class No. 11. Iron, iron spikes, and nails:

Joseph L. Savage	3,451 25
D. Babcock & Co	3,168 75
Hyatt & Spencer	†2,784 94
George H. Creed	*2,622 50

Class No. 12. Steel:

Joseph L. Savage	*222 50
Hyatt & Spencer	†226 50
George H. Creed	235 00

Class No. 14. Files:

Joseph L. Savage	*288 74
D. Babcock & Co	289 26
Hyatt & Spencer	†272 91
George H. Creed	298 70

Class No. 15. Paints, oils, and glass:

Joseph L. Savage	*2,913 00
Wood, Sharp, & Haines	3,305 35
D. Babcock & Co	3,223 12
Hyatt & Spencer	†3,126 48
George H. Creed	2,972 25

* Accepted.

† Rejected.

Class No. 16. Ship-chandlery:

Joseph L. Savage	$3,402 15
D. Babcock & Co	*3,244 41
Hyatt & Spencer	†3,259 84
George H. Creed	3,903 38

Class No. 17. Hardware:

Joseph L. Savage	1,384 50
D. Babcock & Co	1,307 79
Hyatt & Spencer	†1,314 83
George H. Creed	*1,290 05

Class No. 18. Stationery:

William H. Dempsey	*1,107 89
William Ballantyne	1,248 85
A. S. Barnes & Co	1,560 92

Class No. 20. Hay and straw:

Joseph L. Savage	4,200 00
E. R. Shipman	*3,930 00

Class No. 21. Provender:

Joseph L. Savage	4,030 00
E. R. Shipman	*$3,638 00

Class No. 22. Charcoal:

D. Babcock & Co	*120 00

Class No. 23. Belting, packing, and hose:

Joseph L. Savage	*582 25
D. Babcock & Co	729 60
Hyatt & Spencer	†566 00
George H. Creed	763 00

Class No. 24. Sperm and lubricating oils:

Joseph L. Savage	494 40
D. Babcock & Co	526 00
Hyatt & Spencer	†525 40
George H. Creed	*481 00

Class No. 25. Iron-work, piping, &c.:

Joseph L. Savage	703 00
D. Babcock & Co	575 00
Hyatt & Spencer	†541 43
George H. Creed	*524 60

Offers for supplies for the navy-yard at Philadelphia, Pa., under advertisement dated May 14, 1873.

Class No. 1. Bricks:

Paul J. Field	$184 00
Benjamin Allen	148 00
Joseph L. Savage	*130 00
D. Babcock & Co	210 00
John Sowney	145 00
D. & J. Noblet	136 00

Class No. 6. White pine, spruce, juniper, and cypress.

J. W. Gaskill & Sons	405 00
J. W. Duryea	*364 00

Class No. 9. Gravel and sand:

Paul J. Field	150 00
D. Babcock & Co	250 00
D. & J. Noblet	*62 50
J. W. Paxson & Co	135 00

Class No. 15. Paints, oils, and glass:

Wood, Sharp, & Haines	261 35
Hyatt & Spencer	†95 00
Joseph L. Savage	*88 70
D. Babcock & Co	132 65
George H. Creed	106 50
D. & J. Noblet	114 40

Class No. 16. Ship-chandlery:

Paul J. Field	674 00
Hyatt & Spencer	†$545 00
Joseph L. Savage	594 22
D. Babcock & Co	681 20
George H. Creed	632 95
E. H. Fitler & Co	*547 80
D. & J. Noblet	661 20

Class No. 17. Hardware:

Paul J. Field	174 23
Hyatt & Spencer	†150 18
Joseph L. Savage	*153 27
D. Babcock & Co	156 48
George H. Creed	208 10

Class No. 18. Stationery:

Ferdinand Foster	647 95
A. S. Barnes & Co	975 60
William Ballantyne	671 16
William H. Dempsey	*607 56

Class No. 20. Hay and straw:

Paul J. Field	1,159 20
Joseph L. Savage	1,285 00
John Sowney	*795 00

Class No. 21. Provender:

Paul J. Field	1,123 00
Joseph L. Savage	1,248 00
John Sowney	*927 50

* Accepted.

† Rejected.

Offers for supplies for the naval station at League Island, Pa., under advertisement dated May 14, 1873.

Class No. 1. Bricks:

Paul J. Field	$1,790 00
Joseph L. Savage	1,700 00
Morris Ebert	*1,145 00
D. Babcock & Co	1,400 00
Benjamin Allen	1,290 00
D. & J. Noblet	1,300 00
Charles W. Sanger	1,194 00

Class No. 6. White pine, spruce, juniper, and cypress:

J. Bigler & Co	5,260 00
J. W. Gaskill & Sons	4,458 50
J. W. Duryea	*3,982 50

Class No. 8. Cement:

Joseph L. Savage	540 00
Morris Ebert	588 00
D. Babcock & Co	*504 00
Hyatt & Spencer	†$480 00
D. & J. Noblet	588 00

Class No. 9. Gravel and sand:

Paul J. Field	235 00
Joseph L. Savage	195 00
D. Babcock & Co	250 00
D. & J. Noblet	*125 00
J. W. Paxson & Co	175 00

Class No. 16. Ship-chandlery:

Paul J. Field	519 40
Joseph L. Savage	*325 95
D. Babcock & Co	393 65
Hyatt & Spencer	†344 31

Class No. 18. Stationery:

William Ballantyne	384 94
A. S. Barnes & Co	640 18
William H. Dempsey	*350 11

Offers for supplies for the Naval Asylum at Philadelphia, Pa., under advertisement dated May 14, 1873.

Class No. 1. Clothing:

Jacob Reed	*$4,571 25

Class No. 2. Hats, boots, and shoes:

James Cotter & Sons	*1,168 75

Class No. 3. Provisions:

G. & A. Scheidt	*10,142 30
William P. Corney	10,456 35

Class No. 4. Groceries:

Joseph Hazzard	6,541 75
Anderson & Dunlap	*6,131 90
Thomas Scott & Co	†6,108 12
Crippen & Maddock	6,266 25

Class No. 5. Dry-goods:

Crippen & Maddock	*957 00

Class No. 6. Bread, &c.:

Charles McIntyre	*1,815 00
John McIlwain	1,830 00
Thomas McConnell	1,830 75

Class No. 7. Tobacco:

Paul J. Field	*980 00
Crippen & Maddock	‡970 00
John Baird	970 00

Class No. 8. Coal:

Crippen & Maddock	$2,710 00
Plaisted & McCollin	2,564 62
William F. Moody	*2,497 50

Class No. 9. Paints, oils, and glass:

Wood, Sharp & Haines	*148 15
D. & J. Noblet	177 83
Crippen & Maddock	241 00

Class No. 11. Lumber:

Crippen & Maddock	*350 50

Class No. 13. Provender:

Paul J. Field	297 00
John Sowney	*259 75
Crippen & Maddock	315 00

Class No. 14. Miscellaneous:

Paul J. Field	286 75
Hyatt & Spencer	†210 83
Crippen & Maddock	*286 40

Class No. 15. Hardware:

Paul J. Field	*166 05
Hyatt & Spencer	†165 45
Crippen & Maddock	451 40

Class No. 16. Stationery:

William H. Dempsey	*155 50
William Ballantyne	179 40

* Accepted † Rejected. ‡ Decided by lot.

Offers for supplies for the navy-yard at Washington, D. C., under advertisement dated May 14, 1873.

Class No. 1. Bricks:

Herrill & Childs	$1,400 00
S. P. Brown	*1,240 00
William Guinand	1,400 00
D. Babcock & Co	1,570 00
Joseph L. Savage	1,400 00

Class No. 2. Stone:

S. P. Brown	1,110 00
D. Babcock & Co	900 00
Joseph L. Savage	*585 00

Class No. 5. Oak and hardwood:

Jos. W. Duryea	1,345 00
T. Edward Clark & Co.	1,410 00
Watson & Pittinger	1,830 00
J. W. Gaskill & Sons	*1,210 00
S. P. Brown	1,469 50

Class No. 6. White pine, spruce, juniper, and cypress:

Joseph W. Duryea	*1,355 00
T. Edward Clark & Co	1,600 00
Watson & Pittinger	1,500 00
J. W. Gaskill & Sons	1,502 00
S. P. Brown	1,640 00

Class No. 9. Gravel and sand:

William Guinand	150 00
D. Babcock & Co	170 00
Jos. L. Savage	*110 00

Class No. 11. Iron, iron spikes, and nails:

George H. Creed	*876 00
Hyatt & Spencer	893 25
Joseph L. Savage	930 00

Class No. 12. Steel:

George H. Creed	353 60
Hyatt & Spencer	†$419 90
Joseph L. Savage	*319 50

Class No. 15. Paints, oils, and glass:

George H. Creed	1,045 50
Hyatt & Spencer	†1,050 80
Wood, Sharp & Haines	1,173 50
H. C. H. Webster	1,103 23
D. Babcock & Co	*1,027 10½
Joseph L. Savage	1,077 90

Class No. 16. Ship-chandlery:

George H. Creed	614 35
Hyatt & Spencer	†506 78
D. Babcock & Co	542 25
Joseph L. Savage	*478 50

Class No. 17. Hardware:

George H. Creed	278 15
Hyatt & Spencer	†244 64
Joseph L. Savage	*178 80

Class No. 18. Stationery:

A. S. Barnes & Co	732 82
William Ballantyne	575 47½
William H. Dempsey	*564 75

Class No. 20. Hay and straw:

George M. Beall	1,304 36
F. W. Classen	1,540 00
Solon, Fisher & Co	1,288 00
William Guinand	1,432 00
Joseph L. Savage	1,300 00
Mary H. Dorsey	*1,207 00

Class No. 21. Provender:

George M. Beall	933 00
F. W. Classen	1,164 00
Beall & Shoemaker	1,002 00
Solon, Fisher & Co	874 00
William Guinand	1,128 00
Joseph L. Savage	*858 00
Mary Dorsey	914 00

Offers for supplies for the navy-yard at Norfolk, Va., under advertisement dated May 14, 1873.

Class No. 1. Bricks:

Joseph L. Savage	$1,500 00
J. P. Moore	*1,448 00
A. A. McCullough	1,720 00
A. H. Lindsay	1,700 00
H. V. Neimeyer	1,645 00
D. Babcock & Co	1,600 00

Class No. 4. Yellow-pine lumber:

A. A. McCullough	*$732 00
Lookins & Myers	859 00
Watson & Pittinger	1,092 00
A. H. Lindsay	1,095 00
H. V. Neimeyer	852 00
J. W. Gaskill & Sons	1,232 50

* Accepted.

† Rejected.

Class No. 5. Oak and hardwood:

A. A. McCullough	*$79 20
Watson & Pittinger	382 00
Joseph W. Duryea	184 80

Class No. 6. White pine, spruce, juniper, and cypress:

A. A. McCullough	*1,406 00
Watson & Pittinger	1,604 00
Joseph W. Duryea	1,494 50
J. W. Gaskill & Sons	1,828 50

Class No. 7. Lime, hair, and plaster:

Joseph L. Savage	253 50
A. A. McCullough	*225 00
Lookins & Myers	337 50
Hyatt & Spencer	†300 00
F. W. Classen	322 50
H. V. Neimeyer	258 75
Peters Brothers	255 00
D. Babcock & Co	270 00

Class No. 8. Cement:

Joseph L. Savage	964 00
J. P. Moore	962 00
A. A. McCullough	1,140 00
Hyatt & Spencer	†795 00
F. W. Classen	1,156 00
H. V. Neimeyer	*944 00
George F. Gephart, sec'ty	†400 00
D. Babcock & Co	1,020 00

Class No. 10. Slate:

Joseph L. Savage	825 00
A. A. McCullough	*750 00
Lookins & Myers	1,050 00
Hyatt & Spencer	†870 00
H. V. Neimeyer	870 00
D. Babcock & Co	810 00

Class No. 11. Iron, iron spikes, and nails:

Joseph L. Savage	1,774 16
J. P. Moore	*1,574 05
Hyatt & Spencer	†1,551 12
George H. Creed	1,723 00

Class No. 14. Files:

Joseph L. Savage	198 90
J. P. Moore	*191 95
Hyatt & Spencer	†180 40
George H. Creed	245 00
R. H. Howard & Co	201 05
D. Babcock & Co	211 46

Class No. 15. Paints, oils, and glass:

Jos. L. Savage	983 00
Wood, Sharp & Haines	†$704 10
Hyatt & Spencer	†643 69
Westner, Sheive & Willey	986 50
George H. Creed	770 75
Wilson & Brother	*721 35
D. Babcock & Co	786 75

Class No. 16. Ship-chandlery:

Joseph L. Savage	516 30
Lookins & Myers	605 70
Hyatt & Spencer	†437 37
George H. Creed	*477 10
D. Babcock & Co	640 85

Class No. 17. Hardware:

Joseph L. Savage	*1,699 41
J. P. Moore	1,764 80
Hyatt & Spencer	†1,615 29
George H. Creed	2,099 57

Class No. 18. Stationery:

William Ballantyne	323 09
William H. Dempsey	*307 24
A. S. Barnes & Co	417 95

Class No. 20. Hay and straw:

Joseph L. Savage	3,785 00
A. A. McCullough	*2,211 25
Lookins & Myers	2,845 00
F. W. Classen	3,305 00
A. H. Lindsay	2,545 00
H. V. Neimeyer	2,600 00
Peters Brothers	2,640 00
R. C. Culpepper & Bro	3,570 00

Class No. 21. Provender:

Jos. L. Savage	2,141 25
A. A. McCullough	1,862 75
Lookins & Myers	2,265 00
F. W. Classen	2,525 00
A. H. Lindsay	1,852 75
H. V. Neimeyer	2,090 00
Peters Brothers	*1,786 00
R. McGregor, Treas	3,081 25
R. C. Culpepper & Bro	1,897 75

Class No. 23. Belting, packing, and hose:

Jos. L. Savage	309 00
J. P. Moore	268 85
Lookins & Myers	*194 00
Hyatt & Spencer	†244 20
Geo. H. Creed	280 00
D. Babcock & Co	290 00

Class No. 24. Sperm and lubricating oils:

Jos. L. Savage	*297 44
Hyatt & Spencer	†297 44
Geo. H. Creed	325 60
Wilson & Brother	330 88
D. Babcock & Co	308 00

* Accepted.

† Rejected.

Class No. 25. Iron-work, piping, &c.:

Jos. L. Savage	*$40 00
J. P. Moore	44 70
Hyatt & Spencer	58 48

Class No. 31. Copper and composition nails:

Jos. L. Savage	$446 00
J. P. Moore	464 00
Hyatt & Spencer	†441 20
Geo. H. Creed	*435 00

Offers for supplies for the navy-yard at Pensacola, Fla., under advertisement dated May 14, 1873.

Class No. 1. Bricks:

Jos. L. Savage	$1,100 00
Lookins & Myers	2,250 00
Geo. Pfieffer	*862 50
M. G. Jinestea	890 00

Class No. 4. Yellow-pine lumber:

J. O. Neal	*1,499 00
A. J. Parlin	3,109 00
Geo. H. O'Neal	1,741 50
R. E. Anson	1,605 00

Class No. 6. White pine, juniper, spruce, and cypress:

J. O'Neal	869 00
J. W. Duryea	*490 00
J. D. Kenney	654 00
D. Babcock & Co	630 00

Class No. 7. Lime, hair, and plaster:

Jos. L. Savage	275 00
J. O. Neal	230 00
Geo. Pfieffer	224 00
J. D. Kenney	*220 00
D. Babcock & Co	240 00

Class No. 10. Slate:

Jos. L. Savage	1,950 00
Lookins & Myers	$1,900 00
J. O. Neal	1,050 00
J. D. Kenney	*700 00
Hyatt & Spencer	†498 80
D. Babcock & Co	740 00

Class No. 11. Iron, iron spikes, and nails:

Jos. L. Savage	227 50
J. O. Neal	238 75
J. D. Kenney	*212 50
Hyatt & Spencer	†350 00
D. Babcock & Co	230 00

Class No. 18. Stationery:

John A. Walker	801 92
Wm. H. Dempsey	*707 89
Wm. Ballantyne	723 85

Class No. 20. Hay and straw:

Jos. L. Savage	1,200 00
J. O. Neal	960 00
Thos. C. Quayle	*940 00

Class No. 21. Provender:

Jos. L. Savage	930 00
J. O. Neal	*876 00
Thos. C. Quayle	895 50

Offers for supplies for the navy-yard at Mare Island, Cal., under advertisement dated May 14, 1873.

Class No. 1. Bricks:

A. Powell	*‡$1,500 00
J. D. Piper	1,527 00
N. P. Perine	1,500 00

Class No. 2. Stone:

S. P. Brown	*60,075 00
Oliver Taylor	130,500 00
Griffith, Myers & McCormick	80,100 00
Robt. Stearns	91,800 00

Class No. 3. Yellow-pine timber:

J. E. de la Montagine	*34,469 48
A. Powell	34,754 68
F. M. Brown & Co	39,216 40
A. D. & J. P. Moore	$60,067 60
Seth. H. Wetherbee	38,014 50
John P. Sheldon	45,050 70
John Kentfield & Co	34,545 56
Geo. McMullin	43,460 46
G. A. Meigs	†32,286 29

Class No. 4. Yellow-pine lumber:

J. E. de la Montagine	*1,600 00
A. Powell	2,000 00
F. M. Brown & Co	4,320 00
A. D. & J. P. Moore	2,877 00
S. H. Wetherbee	1,954 00
John Sheldon	2,400 00
John Kentfield & Co	1,915 98
Geo. McMullin	2,080 00
G. A. Meigs	1,720 00

* Accepted. † Rejected. ‡ Decided by lot.

Class No. 5. Oak and hard-wood:	
J. E. de la Montagine ...	*$10,450 00
A. Powell	10,710 00
F. M. Brown	11,752 50
Seth H. Wetherbee	12,169 50
J. Bigler & Co	10,502 50
Class No. 6. White pine spruce, juniper, and cypress:	
J. E. de la Montagine	*1,388 00
A. Powell	1,541 00
F. M. Brown & Co	2,992 00
A. D. & J. P. Moore	1,637 50
Seth H. Wetherbee	1,665 00
John P. Sheldon	2,295 00
John Kentfield & Co	1,639 05
Class No. 7. Lime, hair, and plaster:	
Hanscom & Farwell	6,047 50
A. Powell	5,186 50
Davis & Cowell	*†5,125 00
H. T. Holmes	5,125 00
Class No. 8. Cement:	
Hanscom & Farwell	14,600 00
A. Powell	15,512 50
S. P. Brown	21,827 00
Kittle & Co	12,738 50
F. B. Taylor	14,454 00
H. P. Delafield, sec'y	13,413 75
Davis & Cowell	14,600 00
H. T. Holmes	14,600 00
D. Babcock & Co	*13,395 50
Class No. 9. Gravel and sand:	
Hanscom & Farwell	10,960 00
A. Powell	*4,750 00
J. D. Piper	6,345 00
N. P. Perine	8,500 00
Class No. 11. Iron, iron spikes, and nails:	
Hanscom & Farwell	5,509 00
VanWinkle & Davenport	5,570 50
Linforth, Kellogg & Co ..	4,991 00
D. Babcock & Co	*4,865 00
Hooker & Co	5,202 00
Class No. 12. Steel:	
Hanscom & Farwell	744 00
VanWinkle & Davenport	*$683 00
D. Babcock & Co	696 00
Hooker & Co	†614 00
Class No, 14. Files:	
Hanscom & Farwell	397 27
VanWinkle & Davenport	557 93
Hyatt & Spencer	†292 33
D. Babcock & Co	*345 31
Pillsbury, Webb & Co ...	384 29
Hooker & Co	373 61
Class No. 15. Paints, oils, and glass:	
Hanscom & Farwell	1,449 95
A. C. Deitz & Co	†906 90
F. B. Taylor	1,168 85
Whittier, Fuller & Co ...	1,156 70
D. Babcock & Co	*1,149 50
Class No. 16. Ship-chandlery:	
Hanscom & Farwell	5,928 83
D. Babcock & Co	*5,886 99
Class No. 17. Hardware:	
Hanscom & Farwell	2,694 32
D. Babcock & Co	*2,651 19
Pillsbury, Webb & Co ..	†2,304 10
Hooker & Co	†2,423 76
Class No. 18. Stationery:	
Wm. Ballantyne	1,287 43
Wm. H. Dempsey	†497 97
L. H. Bonestell	*1,054 33
Class No. 21. Provender:	
A. Powell	*1,605 00
Jos. Bassett	1,632 50
Class No. 24. Sperm and lubricating oils:	
Hanscom & Farwell	1,200 00
F. B. Taylor	*1,170 00
Whittier, Fuller & Co ...	1,350 00
D. Babcock & Co	1,188 00
Class No. 25. Iron-work, piping, &c.:	
Hanscom & Farwell	*782 00
VanWinkle & Davenport	813 75
D. Babcock & Co	859 70

* Accepted.

† Rejected.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1875, by the Bureau of Yards and Docks, Navy Department.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1874.
SALARIES.		
Chief clerk, per act of July 5, 1862, (12 Stat. at L., p. 511, sec. 3)	$1,800 00	.....
Draughtsman, per act of Mar. 2, 1867, (14 Stat. at L., p. 450, sec. 1)	1,800 00	.....
One clerk of class four, per act of Mar. 2, 1867, (14 Stat. at L., p. 450, sec. 1)	1,800 00	.....
Two clerks of class three, per act of Mar. 2, 1867, (14 Stat. at L., p. 450, sec. 1)	3,200 00	.....
One clerk of class two, per act of Mar. 2, 1867, (14 Stat. at L., p. 450, sec. 1)	1,400 00	.....
One clerk of class one, per act of Mar. 2, 1867, (14 Stat. at L., p. 450, sec. 1)	1,200 00	.....
One messenger, per act of July 5, 1862, (12 Stat. at L., p. 511, sec. 3,) and July 12, 1870, (16 Stat. at L., p. 250, sec. 3)	840 00	.....
Two laborers, at $720 each, (same acts)	1,440 00	.....
	13,480 00	$15,760 00
CONTINGENT EXPENSES.		
Stationery, books, plans, drawings, incidental labor, and miscellaneous items, (appropriated, 17 Stat. at L., p. 501)	1,800 00	800 00
Public printing and binding, (submitted)	8,000 00	.....
Postage-stamps, (submitted)	2,000 00	.....
NAVAL ASYLUM, PHILADELPHIA.		
Superintendent, (appropriated, 17 Stat. at L., p. 551)	$600 00	
Steward, (appropriated, 17 Stat. at L., p. 551)	480 00	
Matron, (appropriated, 17 Stat. at L., p. 551)	360 00	
Cook, (appropriated, 17 Stat. at L., p. 551)	240 00	
First assistant cook, (appropriated, 17 Stat. at L., p. 551)	168 00	
Second assistant cook; (appropriated, 17 Stat. at L., p. 551)	144 00	
Chief laundress, (appropriated, 17 Stat. at L., p. 551)	192 00	
Three laundresses, $168 each, (appropriated, 17 Stat. at L., p. 551)	504 00	
Eight scrubbers and waiters, $168 each, (appropriated, 17 Stat. at L., p. 551)	1,344 00	
Six laborers, $240 each, (appropriated, 17 Stat. at L., p. 551)	1,440 00	
Stable-keeper and driver, (appropriated, 17 Stat. at L., p. 551)	360 00	
Master-at-arms, (appropriated, 17 Stat. at L., p. 551)	720 00	
Corporal, (appropriated, 17 Stat. at L., p. 551)	300 00	
Barber, (appropriated, 17 Stat. at L., p. 551)	360 00	
Carpenter, (appropriated, 17 Stat. at L., p. 551)	845 00	
	8,057 00	.....
Furnaces, grates, and ranges, (appropriated, 17 Stat. at L., p. 551)	600 00	
Increasing library, postage-stamps, and car-tickets, (appropriated, 17 Stat. at L., p. 551)	300 00	
Repairs of all kinds, (appropriated, 17 Stat. at L., p. 551)	15,350 00	
Support of beneficiaries, (appropriated, 17 Stat. at L., p. 551)	45,000 00	
	61,250 00	.....
	69,307 00	58,478 00

NOTE.—The expenses of the Naval Asylum to be paid from income of the Navy pension-fund, in compliance with provisions of act of March 1, 1869, (15 Stat. at L., p. 277.)

CIVIL ESTABLISHMENT.			
At the navy-yard, Kittery, Me.:			
Draughtsman and clerk to civil engineer, $1,500 each, (appropriated, 17 Stat. at L., p. 550)	$3,000 00		
Time-clerk, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Store-clerk, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Bill-clerk to commandant's office, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Gate-keeper and detective, (appropriated, 17 Stat. at L., p. 550)	1,000 00		
Messenger to commandant's office, (appropriated, 17 Stat. at L., p. 550)	600 00		
		9,100 00	4,400 00
At the navy-yard, Charlestown, Mass.:			
Assistant civil-engineer, (appropriated, 17 Stat. at L., p. 550)	1,800 00		
Draughtsman and clerk to civil engineer, $1,500 each, (appropriated, 17 Stat. at L., p. 550)	3,000 00		
Time-clerk, (appropriated, 17 Stat. at L., p. 550)	1,500 00		

Estimate of appropriations required for the service of the fiscal year, &c.—Continued.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.		Amount appropriated for the current fiscal year ending June 30, 1874.
CIVIL ESTABLISHMENT—Continued.			
Store-clerk, (appropriated, 17 Stat. at L., p. 550)	$1,500 00		
Writer to commandant, (appropriated, 17 Stat. at L., p. 550)	1,000 00		
Bill-clerk for commandant's office, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Gate-keeper and detective, (appropriated, 17 Stat. at L., p. 550)	1,000 00		
Messenger to commandant's office, (appropriated, 17 Stat. at L., p. 550)	600 00		
		$11,900 00	$6,900 00
At the navy-yard, Brooklyn, N. Y.:			
Assistant civil engineer, (appropriated, 17 Stat. at L., p. 550)	1,800 00		
Draughtsman and clerk to civil engineer, $1,500 each, (appropriated, 17 Stat. at L., p. 550)	3,000 00		
Time-clerk, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Store-clerk, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Writer to commandant, (appropriated, 17 Stat. at L., p. 550)	1,000 00		
Bill-clerk for commandant's office, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Gate-keeper and detective, (appropriated, 17 Stat. at L , p. 550)	1,000 00		
Mail-messenger, (appropriated, 17 Stat. at L., p. 550)	900 00		
Messenger to commandant's office, (appropriated, 17 Stat. at L., p. 550)	600 00		
		12,800 00	7,800 00
At the navy-yard, Philadelphia, Pa:			
Assistant civil engineer, in charge, (appropriated, 17 Stat. at L., p. 550)	$2,000 00		
Draughtsman and clerk to civil engineer, $1,500 each, (appropriated, 17 Stat. at L., p. 550)	3,000 00		
Time-clerk, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Store-clerk, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Bill-clerk for commandant's office, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Gate-keeper and detective, (appropriated, 17 Stat. at L., p. 550)	1,000 00		
Messenger to commandant's office, (appropriated, 17 Stat. at L., p. 550)	600 00		
		11,100 00	4,400 00
At the navy-yard, Washington, D. C.:			
Draughtsman and clerk to civil engineer, $1,500 each, (appropriated, 17 Stat. at L., p. 550)	3,000 00		
Time-clerk, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Store-clerk, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Bill-clerk for commandant's office, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Gate-keeper and detective, (appropriated, 17 Stat. at L., p. 550)	1,000 00		
Mail-messenger, (appropriated, 17 Stat. at L., p. 550)	1,000 00		
Messenger to commandant's office, (appropriated, 17 Stat. at L., p. 550)	600 00		
		10,100 00	5,400 00
At the navy-yard, Norfolk, Va.:			
Superintendent of yard improvements, (appropriated, 17 Stat. at L., p. 550)	2,000 00		
Draughtsman and clerk to civil engineer, $1,500 each, (appropriated, 17 Stat. at L., p. 550)	3,000 00		
Time-clerk, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Store-clerk, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Bill-clerk for commandant's office, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Gate-keeper and detective, (appropriated, 17 Stat. at L., p. 550)	1,000 00		
Mail-messenger, (appropriated, 17 Stat. at L., p. 550)	900 00		
Messenger to commandant's office, (appropriated, 17 Stat. at L., p. 550)	600 00		
		12,000 00	4,400 00
At the navy-yard, Pensacola, Fla.:			
Superintendent of yard improvements, (appropriated, 17 Stat. at L., p. 550)	2,000 00		
Time-clerk, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Store-clerk, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Gate-keeper and detective, (appropriated, 17 Stat. at L., p. 550)	1,000 00		
Messenger to commandant's office, (appropriated, 17 Stat. at L., p. 550)	600 00		
		6,600 00	3,600 00

Estimates of appropriations required for the service of the fiscal year, &c.—Continued.

Detailed objects of expenditure and explanations.		Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1874.
At the navy-yard, Mare Island, Cal.:			
Assistant civil engineer and draughtsman, (appropriated, 17 Stat. at L., p. 550)	$2,000 00		
Clerk to civil engineer, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Time-clerk, (appropriated, 17 Stat. at L., p. 550)	1,875 00		
Store-clerk, (appropriated, 17 Stat. at L., p. 550)	1,875 00		
Bill-clerk for commandant's office, (appropriated, 17 Stat. at L., p. 550)	1,500 00		
Gate-keeper and detective, (appropriated, 17 Stat. at L., p. 550)	1,000 00		
Messenger to commandant's office, (appropriated, 17 Stat. at L., p. 550)	750 00		
		$10,500 00	$5,050 00
At the naval station, League Island, Pa.:			
Assistant civil engineer, (appropriated, 17 Stat. at L., p. 551)	1,800 00		
Draughtsman and clerk to civil engineer, $1,500 each, (appropriated, 17 Stat at L., p. 551)	3,000 00		
Time-clerk, (appropriated, 17 Stat. at L., p. 551)	1,500 00		
Store-clerk, (appropriated, 17 Stat. at L., p. 551)	1,500 00		
		7,800 00	2,800 00
FOR GENERAL MAINTENANCE OF YARDS AND DOCKS.			
For general maintenance of yards and docks; freights and transportation of materials and stores; printing, stationery, and advertising, including the commandant's office; books, maps, models, and drawings; purchase and repair of fire-engines; machinery and patent-rights to use the same; repairs of steam-engines and attendance on the same; purchase and maintenance of oxen, horses, and driving teams; carts and timber-wheels for navy-yard purposes; tools and repairs of the same; postage on letters and other mailable matter on public service, and telegrams; furniture for Government houses and offices in navy-yards; coal and other fuel; candles, oil, and gas; cleaning and clearing up yards, and care of public buildings, attendance on fires, lights, fire-engines, and apparatus; incidental labor at navy-yards; water-tax; tolls and ferriages; pay of watchmen in navy-yards; flags, awnings, and packing-boxes for Bureau of Yards and Docks purposes; (appropriated, 17 Stat. at L., p. 551)		860,000 00	860,000 00
CONTINGENT.			
For contingent expenses that may arise at navy-yards and stations; (appropriated, 17 Stat. at L., p. 551)		50,000 00	40,000 00
Navy-yard, Portsmouth, N. H., repairs of all kinds to preserve navy-yard; (appropriated, 17 Stat. at L., p. 368)		103,000 00	93,500 00
Navy-yard, Boston, Mass., repairs of all kinds to preserve navy-yard; (appropriated, 17 Stat. at L., p. 368)		137,500 00	125,000 00
Navy-yard, Brooklyn, N. Y., repairs of all kinds to peserve navy-yard; (appropriated, 17 Stat. at L., p. 368)		152,000 00	125,000 00
Navy-yard, Philadelphia, Pa., repairs of all kinds to preserve navy-yard; (appropriated, 17 Stat. at L., p. 368)		78,000 00	40,000 00
Navy-yard, Washington, D. C., repairs of all kinds to preserve navy-yard; (appropriated, 17 Stat. at L., p. 368)		100,000 00	75,000 00
Navy-yard, Norfolk, Va., repairs of all kinds to preserve navy-yard; (appropriated, 17 Stat. at L., p. 368)		85,683 77	75,000 00
Navy-yard, Pensacola, Fla., repairs of all kinds to preserve navy-yard; (appropriated, 17 Stat. at L., p. 368)		83,305 51	25,000 00
Navy-yard, Mare Island, Cal., repairs of all kinds to preserve navy-yard; (appropriated, 17 Stat. at L., p. 368)		101,100 00	97,760 00
Naval station, Sackett's Harbor, N. Y., repairs of all kinds to preserve navy-yard; (appropriated, 17 Stat. at L., p. 368)		2,000 00	.....
Naval station, Mound City, Ill., repairs of all kinds to preserve navy-yard; (appropriated, 17 Stat. at L., p. 368)		2,000 00	.....
Naval station, New London, Conn., repairs of all kinds to preserve navy-yard; (appropriated, 17 Stat. at L., p. 368)		10,000 00	5,000 00
Naval station, Key West, Fla., repairs of all kinds to preserve navy-yard; (appropriated, 17 Stat. at L., p. 368)		5,000 00	5,000 00
Naval station, New Orleans, La., repairs of all kinds to preserve navy-yard; (appropriated, 17 Stat. at L., p. 368)		5,000 00	.....
		864,589 28	.....

No. 5.

BUREAU OF NAVIGATION.

NAVY DEPARTMENT,
Bureau of Navigation, October 25, 1873.

SIR: I have the honor to submit the following report of the Bureau of Navigation for the past year, together with estimates for its support, and for the expenditures that will probably be required in that division of the naval service committed to its immediate charge, for the fiscal year ending June 30, 1875. Included in this report, and transmitted herewith, are the reports and estimates of the several officers under its cognizance.

NAVIGATION.

The Laurent octant, of which mention was made in my previous report as having been deemed worthy of trial, has been found sufficiently useful in night observations to warrant its being supplied to all our sea-going ships-of-war.

The errors of the compass, due to a ship's iron, have been found of sufficient importance, even on board our wooden ships, to receive special attention in the Navy for some time past; but when the ship, in addition to the iron carried in her machinery and equipment, is iron-built, the importance of this subject becomes specially manifest. In reality, the adaptation and treatment of the marine compass on board all our modern ships, whether of the Navy or of the merchant-service; the means for most readily finding the compass-errors, and of applying correctors whenever deemed expedient; and the study of the ship's magnetic characteristics, with the practical inferences deducible therefrom, are questions which had assumed so great importance within a comparatively brief period as to appear to justify, during the past year, bringing the matter to your notice in a special communication, and in recommending that a suitable officer of the Navy be placed in immediate charge of this duty under the supervision of the Bureau. You responded favorably to these suggestions, and detailed Professor B. F. Greene, of the Navy, as superintendent of compasses. Professor Greene, who has been occupied with this work since the 1st of April last, submits a first report of his operations, appended hereto, to which I ask your attention.

HYDROGRAPHY.

Since my last report a considerable extension has been given to hydrographic work in various directions.

The Wyoming, commanded by Commander F. H. Baker, has made a very good running survey of the east coast of Mexico, from the Rio Grande to the mouth of the Coatzacoalcos.

Other vessels have executed partial surveys in the West Indies, and others again on the east coast of South America.

The Portsmouth, commanded by Commander J. S. Skerrett, is now upon her field in the North Pacific Ocean, and has examined all the supposed possible dangers lying between the Sandwich Islands and our west coast. This vessel is now employed to the westward of those islands.

The Narragansett, commanded by Commander George Dewey, has

made a good running survey from San Diego to Cape Corrientes, and is now at work within the Gulf of California, upon the completion of which survey she will join the Portsmouth.

All the results of these surveys, when received, are verified at the Hydrographic Office, prepared for publication, and published as rapidly as practicable. A liberal yearly appropriation is necessary to keep this work in progress, and is demanded by every consideration of public interest.

Besides these general surveys, much miscellaneous work is now being done, in special surveys of islands, harbors, and portions of coast-lines, within the limits of the several foreign naval stations, and in ascertaining the positions of reported dangers, or in disproving their existence.

A resolution of Congress, authorizing the employment of a vessel-of-war in making deep-sea soundings in the Pacific Ocean, caused the Department to detail the Tuscarora, commanded by Commander George E. Belknap, for that purpose. Excellent results are being obtained; and, although the season of the year has been unfavorable, soundings of great accuracy appear to have been taken for a distance of one thousand miles, from Puget Sound towards the Aleutian island of Atcha, gradually increasing depths to three statute miles.

The Fortune is being fitted, and is designed to proceed to the West Indies, for the determination of longitudes by means of the telegraphic lines now established, and for other observations in that region, to render the navigation of those waters less dangerous.

The surveys for an interoceanic ship-canal by the Napipi route have been continued to the Pacific during this year, with marked advantage, via the Doguado, one of the streams which form the Napipi. It is supposed that this survey completes the examination of all the water-sheds between Panama and the region lying south and east of that point, embracing all the lines, in fact, that gave promise of a favorable result.

The surveys via Lake Nicaragua for the same object have also been completed, and are, like the other surveys, in a high degree satisfactory.

It is perhaps advisable to advert to the general plan pursued in both surveys, in order to establish the fact that no other lines are as favorable for the construction of a ship-canal, within the limits designated, as those that are indicated. This plan has been to examine, locate geographically, and level up all the water-courses of both coasts, until having arrived at such altitudes and such distances apart of the several water-sheds of the two oceans as would settle the question of practicability of the points examined relatively to those which have been thoroughly surveyed.

The work on these surveys has been extremely laborious, tasking the highest qualities of the officers and men employed; and it is gratifying to this Bureau at their close to call officially to your notice the great merits of Commanders T. O. Selfridge and Edward P. Lull, the officers in charge of these two surveys, and the junior officers, who worked with great zeal and intelligence.

In connection with these surveys, it is proper to add that, on the east coast, the Kansas, Commander Allen V. Reed, was employed in aiding the survey under Commander E. P. Lull, and on the Pacific side, the Tuscarora, commanded by Commander George E. Belknap, aided the party under Commander T. O. Selfridge, furnishing a base of supplies, and men to assist in the field and execute the necessary hydrographic work.

The appended report of the Hydrographer gives special information in relation to the several subjects connected with the publication of

charts, sailing-directions in various parts of the world, corrected light-house lists, and tide-tables. A careful examination of it will show how actively the Hydrographic Office has been employed, and how useful it will be to our commerce, as its publications become more numerous.

In connection with this Office it may be well to state that the appropriations asked for are, in part, rather apparent than real, considered as a tax upon the Treasury, since all the moneys received from the sale of charts and other hydrographic publications revert to the Treasury.

I beg leave again to invite your attention to the increasing necessity of a more suitable building for the Hydrographic Office than the one now occupied. Aside from the insufficiency of room in the present building, there is constant danger of losing by fire the very valuable original data already collected, and steadily increasing, which could not be replaced in case of accident but by the same labor and expense through which they were obtained.

NAVAL OBSERVATORY.

By the report of the Superintendent of the Naval Observatory, it will be seen that there has been no cessation in the efforts of the superintendent and other officers to increase its usefulness and maintain its position. The appendices of the late volumes fill up the gaps of hitherto unreduced and unpublished observations in years past, and bring up the work of the Observatory nearly to date. The officers of the Observatory, with commendable zeal, have, in addition to their routine work, devoted much time to the details of the preparation for the observations of the approaching transit of Venus; some of their number forming the majority of the commission authorized by Congress for that purpose. The preparatory work for making the observations is, in fact, well-nigh complete.

The large dome of the great equatorial telescope is completed, and ready for the instrument, which will probably be mounted during the month of October, thus supplying one of the greatest wants of the Observatory, and making it an institution deserving the continued fostering care of the Department.

NAUTICAL ALMANAC.

The report of the Superintendent of the Nautical Almanac sets forth the progress of the work under his charge.

It will be seen that the larger Ephemeris, which includes that computed for the meridian of Washington, meets with an increasing demand from all parts of the United States. More than 1,400 copies have been required for sale and distribution during the past year. Of the part for navigators, comprising that computed for the meridian of Greenwich, more than 4,000 copies have been sold.

The Nautical Almanac is now well up to more than three years in advance of date of publication.

NAVY-SIGNALS.

The International Signal-Code, of which mention was made in my report of last year as being in course of publication by this Bureau, has been stereotyped, and a limited edition printed, which is now in the hands of the binder. These books, after supplying the Navy with a sufficient number of copies for its own use, will be placed on sale in the

principal nautical stores of the maritime ports for the use of such of our merchantmen as may desire to have the code at the mere cost of paper, printing, and binding. It is to be hoped that the masters of our merchant-ships will provide themselves with copies of this book, and with the necessary signal-flags, to enable them to hold communication, not only with the Navy and coast-stations of the United States, but, in time of need, with the ships and signal-stations of other maritime countries.

A new tactical signal-book for the Navy has been prepared, and is now ready for publication, requiring no distinctive flag for its use. As soon as practicable another signal-book for general service will be prepared to replace that now in use. In connection with this subject, it may be added that a key has been arranged for use, whenever desired, which will render the acquisition of our signal-books of no value to an enemy if it should ever fall into his hands.

The Army-signal method, admirable as it is for communicating with one or more parties in front, is of doubtful value in naval tactics, since it will often require to be read properly when seen from all quarters at the same time. In view of this, experiments are in progress for the use of chronosemic signals. The flash system, also, is under investigation. In the mean time the use of the Coston night-signals and of the day-flags will be regarded as in general sufficient for tactical purposes, employing the Army method as usual whenever specially available.

I am, sir, very respectfully, your obedient servant,

DANIEL AMMEN,
Chief of Bureau of Navigation.

Hon. GEO. M. ROBESON,
Secretary of the Navy.

OFFICE OF THE SUPERINTENDENT OF COMPASSES,
BUREAU OF NAVIGATION, NAVY DEPARTMENT,
Washington, October 31, 1873.

SIR: In obedience to the order of the honorable Secretary of the Navy, I reported to you, on the 28th of March last, as Superintendent of Compasses; and, among the general instructions which I thereupon received was one directing me to "submit a report, at least once a year, of the general results of my operations." In conformity with this instruction I beg now to submit the following statement concerning the work committed to my hands since the date above mentioned.

It may be proper to mention, that certain unfinished duty, which had been previously assigned to me in connection with the editorial supervision of the first official edition of the International Signal Code, has necessarily occupied some of the time which would otherwise have been devoted to my regular duties.

THE NAVY COMPASSES—RECENT IMPROVEMENTS.

As already known, through the annual reports of the Bureau of Navigation, the Liquid Compass, as made by Messrs. E. S. Ritchie & Sons,* of Brookline, Mass., near Boston, has been in course of gradual intro-

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* It should be said, in explanation of this apparent partiality for the productions of a single private work-shop, that the Messrs. Ritchie are not only the original patentees, but the sole makers, of these compasses.

duction by the Bureau into the Navy for a number of years past, till, at length, under the several forms of Azimuth, Steering, Tell-tale, and Boat-compass, it has come to be exclusively used on board all United States ships of war. And I believe the conviction is quite well established among officers of the Navy, as the result of experience, essentially tentative from the beginning, that this compass, in its fundamental features of a bouyant card in a liquid medium, with a pressure at the pivot, upward or downward, entirely at control, is not only sound in principle, but convenient and reliable in use. In my opinion it satisfies the three fundamental desiderata of a marine compass, by admitting—(1) of sufficient magnetic power, (2) of great stability or steadiness, and (3) of extreme sensibility. As supplied to the Navy for several years past I am fully satisfied that, in stability and sensibility, even with much rough service, it leaves little to be desired. In regard to magnetic power, although, as tried by experience, it appears quite satisfactory, in both intensity and permanency, still I think it admits of being improved in both particulars.

But, while appreciating very highly the intelligent and careful workmanship bestowed upon the construction of the Navy compasses, I have for some time believed that they admitted of improvement in certain details, which would enhance their value for some requirements of their use in modern navigation. I allude more particularly to the general details of the card, and especially to the construction of the card circle; having believed that it admits of a higher degree of precision in its construction and adjustment upon the card.

Relative to the question of compass improvement, it may of course be admitted that, in certain features of its construction, and under the trying circumstances of its use on board ship, the marine compass is hardly to be regarded as belonging to the class of "instruments of precision." But, although an accuracy of an eighth or even of a quarter of a point may be deemed sufficient for ordinary steering in an open sea, it would seem that this, as an error incident to the observation of a course, should not be too greatly complicated by unknown errors of the instrument itself; inasmuch as we have no certainty as to the limit of the total errors, while the aggregate may prove to be quite serious. Besides, it is believed that the modern problems of navigation require for their solution the aid of closer-steering. Especially, for all observations of deviations arising from the magnetic condition of the ship, the compass should admit of accurate and reliable results.

In view of such considerations, I am led to believe that the compass, as an instrument of observation, the most important to the navigator, should be as perfect in its construction and adjustment as it is practicable to have it; and that, as occasion occurs, in accordance with its special requirements, such limits should be assigned to the errors of observation as may be deemed sufficient for the end to be accomplished.

I beg, however, to be understood, in thus alluding to the possibility of improving the Navy compasses, as not intending to disparage them in the slightest degree. And it is but right to say, in justice to the makers, that they have always responded most promptly to every suggestion of this kind; being apparently desirous to achieve every practicable excellence in the construction of their compasses, even when attended by considerable immediate outlay. It is, therefore, with much satisfaction, that I bring to your notice the following particulars in which substantial progress is now being made in this direction:

First, of the compass card.—A new card-circle has been devised, which, as now made, insures greater precision in all the details of its formation—alike in cutting out, centering, printing, and fixing upon

the card. Two card-magnets, set nearly upon the parallel chords of sixty degrees, will hereafter be provided in all Navy compasses, except those for boat use, in the new construction of the card; by which means the card satisfies conditions more favorable, not only to mechanical stability, but also to the diminution of certain components of compass deviation, which might otherwise result whenever the lengths of the card-magnets have an appreciable ratio to the distances of the nearer masses of iron. And in the new construction it is believed that it will be practicable to gain somewhat in magnetic power by increasing the magnetic moment of the card, without proportionally increasing its moment of inertia. Attention is also being given to the question of securing the utmost permanency in the intensity of the individual magnets. Finally, it is proposed to test the use of sapphire, instead of agate, in the caps of all cards, except those of boat compasses; as, notwithstanding the very small pressure of these cards upon the pivots, (only about fifty grains at the mean temperature,) there is still an appreciable wear of the agates, and, with the alteration of figure, a corresponding increase of friction and diminution of sensibility.

With these improvements actually perfected, in conjunction with the means for a more precise adjustment of the N. and S. line of the card circle to the magnetic axis of the card, it is believed that the card of the Navy compass will have reached a condition quite as satisfactory as, in the nature of the case, it is reasonable to expect.

Secondly, of the azimuth circle.—The feature of making the azimuth circle interchangeable upon every bowl of the same class, alike of those used for steering and for azimuth purposes, has been extended to all the Navy compasses except those designed for boat use. This provision, of advantage in several respects, necessarily requires much nicety of construction of the parts affected by it.

The Messrs. Ritchie are now occupied with several proposed modifications of the azimuth appendages, which promise to add materially in precision and convenience, and, perhaps, in other respects, to the resources of the azimuth circle. These modifications include the use of two prisms instead of one, and of a small spirit-level fixed transversely to the line of sight; through which means the observer, bringing the object into the line of sight, and looking downwards, perfects the contact and reads the card at the coincidence of the prolonged hair-line, apparently projected upon the card divisions, while noticing at the same time, and adjusting for, any deviation from transverse horizontality of the azimuth circle, by the level which is also in the field by reflection. An additional mirror provides for the more precise bearing of an object high in altitude, whenever necessary or expedient, to take azimuths of such objects. It should be added that all the details of these azimuth appendages have been greatly strengthened and rendered correspondingly more stable, when once adjusted by the makers, than heretofore.

These indications sufficiently attest the unwearied attention given by the Messrs. Ritchie, and especially by their senior partner, to the subject of compass improvement; and I think that they afford the promise of ultimately securing a much more perfect instrument of this kind than any hitherto had in Navy use.

But, whatever may be proposed or attempted in this way, should be accompanied by corresponding means of precise adjustment of the several parts of the compass during construction, and of reliable tests of actual condition when completed; otherwise no certainty can be had of progress on the one hand, or of declension on the other; and this subject, I beg to say, has received my particular attention during the past few months.

INSPECTION OF COMPASSES—COMPASS OBSERVATORY.

The liquid compasses, as you are aware, have never been subjected to an examination of their adjustments, at any time, either before or after being received for issue to our ships of war. For this there have been several reasons; but the principal one has been a certain inconvenience in applying any accurate tests of condition to these compasses, on account of the peculiarities of their construction. In the absence of such tests, a substitute has hitherto been found in the acknowledged reputation of the makers for conscientious attention to the details of their compass construction.

But this has hardly seemed a satisfactory state of things, inasmuch as it involves an assumption which, even with the best intentions, cannot be accepted as a certainty, still less can it give us the means of verifying any real or supposed excellence, or even of detecting a serious defect.

With these convictions I submitted to the Bureau, early in the summer, a proposed remedy, which, under all the circumstances, appeared best adapted to the end in view. This was the establishment of a compass observatory, to be located in Brookline, near the Messrs. Ritchies' work-shop, suitably equipped with instruments for a precise determination at any moment of the magnetic meridian, as well as for such concurrent observations in the process of compass adjustment as should be deemed expedient. By such a provision it was intended, in the first place, to supply the makers of the Navy compasses with the means readily accessible for effecting, with every practicable precision, all the fixed adjustments of these instruments, in conformity with the instructions which they might receive from time to time from the superintendent of compasses; and, secondly, on the part of the superintendent, to acquire the requisite facilities, during official inspections, for the needed verifications and other desired tests of condition of all compasses, whether recently made or repaired, prior to their acceptance for Navy use.

After several conferences with the Messrs. Ritchie, it was proposed by Mr. Ritchie, sr., to erect at his own expense on his private grounds a suitable building for the compass observatory, the Bureau on its part to loan the requisite instruments for its complete equipment; it being understood that the observatory, so equipped, was to be freely used by the Messrs. Ritchie, whenever needed for their compass adjustments, and that all its facilities were to be alike available to the superintendent of compasses during his official tests of the finished compasses awaiting his inspection; all being in accordance with the conditions stated in the preceding paragraph.

The conditions of this arrangement having been approved by you in May last, I have now to report that a suitable building for the proposed observatory was erected during the months of August and September, and the principal instruments supplied and put in place on the first of the present month.

The compass observatory, as thus provided, is situated at least a hundred feet distant from any other structure, and has been carefully and thoroughly built, without the use of magnetic material in any part of it. It is furnished with three piers in the line of the magnetic meridian. Upon the south pier is placed a delicate magnetic collimator. Upon the middle pier a theodolite is mounted for observing the collimator, and, by turning over the telescope, for defining the direction of the magnetic

meridian, thus determined, with reference to the magnetic axis of a compass card, or that of a completed compass placed upon the north pier. The whole arrangement is essentially the same as that used for the examination of dry or air-compasses by the compass department of the British Admiralty, of which a description was kindly furnished to the Bureau several years ago by the superintendent of that department. Certain modifications are made necessary, in the present case, in the mode of conducting the observations for adjustments and tests of the liquid compasses on account of their peculiarities of construction.

COMPASS DEVIATIONS AND THEIR TREATMENT—MAGNETISM OF SHIPS.

An important part, as I have conceived, of the duties assigned to me has reference to the subject of compass deviations and their treatment on board ship; including under this head the determination of the deviations, as well as the corresponding modifications of the directive and vertical forces, due to the magnetic action of the ship's iron; deducing therefrom the magnetic elements of the ship, and the application of such practical remedies as, in particular cases, may be deemed expedient, from the knowledge thus obtained of the magnetic character of the ship.

For several years past, under a provision of the Navy regulations, our ships of war have generally been swung, before going to sea from their ports of outfit, for compass deviations, and the reports of the observations transmitted to the Bureau of Navigation. At present, nearly all the sea-going ships have wooden hulls, and the deviations of their compasses, due to the magnetic action of the machinery, equipment, and armament, are moderate in amount; and, consequently, there has hitherto been little apparent need of making these results more complete by including observations for magnetic force. But it is now proposed to extend these observations, particularly on board all iron-built ships, to the corresponding determinations of horizontal and vertical force. By means of these additional observations, in connection with greater attention to compass comparisons at different stations on board, simultaneously with the observations for deviation at the standard compass, the requisite data will be had, in the present state of our knowledge of this subject, for forming a definite estimate of the magnetic peculiarities of each ship; and, by repeating these observations, occasionally, at different times, and in different parts of the globe, the materials will be had for a continuous magnetic history of the ship. Such a record is valuable, not only in guiding our general treatment of the compasses on board, and in suggesting rules of action in special emergencies, but in contributing to the progressive development of our knowledge, both theoretical and practical, of that important branch of physical technics known as the magnetism of ships.

In the discharge of this part of my duties, I visited, during the month of June last, the United States steamer Michigan, on the northern lakes; as is well known, the only United States man-of-war on those waters, and the oldest iron-built ship in the Navy.

The Michigan is a paddle-wheel steamer of 450 tons; with hull, bulkheads, and deck-beams of iron, as also her paddle-wheels and wheelhouses. She has wooden masts but iron standing rigging. She has poop and hurricane decks; the cabin being under the former, and a pilot-house on the extreme forward part of the latter. The iron smoke-funnel, 4⅓ feet in diameter, and 40 feet high, is situated just abaft the

pilot-house, the distance being but 10 feet from the center of one to the center of the other.

The Michigan was built partly in Pittsburgh, and partly in Erie, Pa., her frame having been set up, and other auxiliary fittings accomplished at the former place, then taken down and transported to Erie, where she was put upon the stocks and completed. She was launched in 1844, and hauled into a temporary dock, where she remained about a year, receiving her final fittings and equipment.

While on the stocks at Erie the Michigan was headed, as nearly as I can ascertain at the present time, about SSE., and while in the dock about N. 60° E., or $8\frac{3}{4}$ points to the eastward of her previous position.

The compass equipment of the Michigan consisted of a $7\frac{1}{2}$-inch liquid steering-compass, in the pilot-house, 11 feet above the main deck; a $7\frac{1}{2}$-inch liquid azimuth, used as a standard, 6 feet vertically above the steering compass, on top of the pilot-house; and a 6-inch dry or air tell-tale in the cabin, 7 feet forward of the taffrail and $6\frac{1}{4}$ feet above the main deck. The compasses were all in the fore-and-aft section. Besides the smoke-funnel, which was but 10 feet abaft the two pilot-house compasses, the galley was directly underneath, on the main deck. On the occasion of my visit we placed an additional $7\frac{1}{2}$-inch dry azimuth compass on the poop, 12 feet above the main deck, and 22 feet forward of the taffrail.

Two stations were selected for the observations. The first, at Put-in-Bay, in Lake Erie, in latitude 41° 39′ N., longitude 82° 48′ W.; the second, in Beaver Harbor, at the entrance of Lake Michigan, in latitude 45° 45′ N., longitude 85° 26′ W.; these stations giving the greatest change of latitude, within the limits of the cruise, from Erie to Chicago.

The ship was swung twice on the thirty-two points, and once on the cardinal and quadrantal points at Put-in-Bay; the first for deviations with the iron steam-cutter, which was carried on the port-bow, in davits; the second for deviations with the steam-cutter lowered; and the third for deviations and horizontal force on each of the eight headings, and for vertical force on the cardinal points. She was swung once on the thirty-two points in Beaver Harbor, for deviations on all the headings, for horizontal force on the eight regular points, and for vertical force on the cardinal points alone. The swinging of the ship was effected by warps and kedges, and the observations made by the method of reciprocal bearings. The shore observations were made with a Navy theodolite, reading both the limb and needle arcs; while the bearings on board were taken with the standard compass, accompanied by simultaneous observations of the ship's head, with all the compasses, and of the angle of heel with a spirit-clinometer. All the arrangements for the observations were under the personal supervision of Commander George Brown, United States Navy, commanding the Michigan; and I beg to record my appreciation of the zeal and interest manifested by him, and by all the officers detailed by him as assistants, to obtain results which should be in every respect satisfactory.

Of course, it would be unsuited to the purpose of this report to enter into details, either of the observations themselves, or of the subsequent calculations; but it is presumed that a statement of the principal results, as presented in the following tabular form, together with a brief summary of the conclusions deducible therefrom, will not be inappropriate.

RESULTS OF MAGNETIC OBSERVATIONS, UNITED STATES STEAMER MICHIGAN.

TABLE I.—*Put-in Bay observations, June 23 and 24, 1873.*

Ship's head by compass.	Steam-cutter in davits.				Steam-cutter lowered.
	Compass deviation.		Directive force on board.		Deviation of standard compass.
	Standard or fore compass.	Poop or aft compass.	At fore compass.	At aft compass.	
	°	°			°
N	1.6 W.	2.2 E.	0.605	1.190	1.6 W.
N. E	16.1 W.	10.4 E.	0.667	1.055	16.1 W.
E	23.5 W.	10.2 E.	0.869	0.960	24.6 W.
S. E	18.5 W.	3.6 E.	1.177	0.809	19.1 W.
S	0.5 W.	2.5 W.	1.399	0.804	0.7 W.
S. W	16.9 E.	7.7 W.	1.153	0.860	17.8 E.
W	20.3 E.	12.1 W.	0.847	0.960	22.4 E.
N. W	12.8 E.	8.1 W.	0.653	1.124	12.8 E.

TABLE II.—*Beaver Harbor observations, June 28, 1873.*

Steam-cutter in davits.		
Ship's head by compass.	Deviation of standard compass.	Directive force on board at standard compass.
	°	
N	4.9 W.	0.501
N. E	22.5 W.	0.609
E	31.0 W.	0.853
S. E	21.5 W.	1.263
S	3.5 E.	1.471
S. W	23.9 E.	1.160
W	27.9 E.	.....
N. W	15.0 E.	0.547

TABLE III.—*Magnetic elements of the Michigan.*

Places of observation.	Polar force.		Quadrantal force.		Reduced directive force.		Mean vertical force.
	Intensity.	Direction angle.	Intensity.	Direction angle.	Mean northward force.	Mean equatorial force.	
Put-in Bay.		°		°			
Fore compass	0.387	181.3	0.039	9.8	0.948	0.022 W.	0.973
Aft compass	0.195	11.8	0.032	12.8	0.972	0.009 W.	0.837
Beaver Harbor.							
Fore compass	0.509	187.1	0.036	9.7	0.956	0.021 W.	.....

The deviations and other angles are expressed in degrees and tenths.

The forces, with the exception of the vertical force, are expressed in decimal parts, the earth's horizontal force (directive force on shore) being taken as 1,000. The vertical force is expressed in decimal parts, the earth's vertical force being taken as 1,000.

The direction angles are reckoned from the ship's head, round the circle, by starboard, stern, and port.

Explanation of the tabular results.—Table I, of the Put-in Bay observations, gives the deviations at both the fore and aft compasses, and the

directive force acting at those compasses, on the eight principal headings of the ship; the deviations being expressed in degrees and decimals to the nearest tenth, and the directive force in decimal parts, the earth's horizontal force (directive force on shore) being taken as unity, or 1,000. These observations were made with the steam-cutter in davits. The detached column at the right gives the deviations alone, on the same headings, with the steam-cutter lowered. The deviations obtained on the eight principal headings, concurrently with the observations for horizontal force, were nearly identical with those obtained on the same headings in the first complete set, with the steam-cutter in davits, and are not here given.

Table II of the Beaver Harbor observations gives the results in that place, corresponding in all particulars with those of Table I.

Table III gives the magnetic elements of the ship, as deduced from the observations for deviation and magnetic force. Of these, the *polar force* is the resultant of the permanent horizontal magnetism and transient vertical magnetism of the ship—the two components acting upon the compass in the same manner—that of a permanent magnet. The polar force of the ship is variable in different geographical positions, depending on the horizontal force and dip among the earth's magnetic elements.

The quadrantal force is the transient horizontal magnetism of the ship, and remains unchanged in different places.

The mean northward force is the mean of all the values of the directive force acting in the direction of the compass, reduced to the magnetic meridian, for any number of equidistant headings round the circle of swing. It is a constant.

The mean equatorial force is a similar mean for the directive force, reduced to the magnetic equatorial. As a magnetic force, therefore, it has no real value, except where there is iron unsymmetrically placed with respect to the fore and aft section of the ship; but it always involves whatever constant error may exist in the compass, either from defective adjustments, or being out of the fore and aft section. In the case of the Michigan, it is believed to be mainly, if not wholly, due to instrumental errors.

The mean vertical force is the mean of the different values of the whole vertical force acting at the compass, for any number of equidistant headings round the circle of swing. It is made up of the earth's vertical force, and the permanent and transient vertical magnetism of the ship. It is variable for changes of geographical position, like the polar force of the ship.

General conclusions.—Referring first to the Put-in Bay observations, it will be seen that there is a marked difference between the deviations of the fore compass and those of the aft compass. Thus, at the fore compass the deviations are not only quite large, exceeding two points at their maximum, but they are left-handed, or westerly on easterly headings, and easterly on westerly headings. At the aft compass, on the other hand, the deviations, while only about half as large, are right-handed, or easterly on westerly headings, &c., and a corresponding difference exists in the directive force at the two compasses. This is a minimum on northerly headings and a maximum on southerly headings at the fore compass, while it is just the reverse at the aft compass; the differences between the extremes and unity (1,000, or the relative directive force on shore) being proportionally greater at the fore compass than at the aft-compass station.

The results of the Beaver Harbor observations, while similar in these

several particulars to the former, are noteworthy in this: that they show a decided increase in the deviations; those of the fore compass, at their maximum, being nearly three quarters of a point larger than those in Put-in Bay. A comparison of the magnetic elements (Table III) shows that the polar force at the fore compass, in Beaver Harbor, is a quarter larger than at the former place. Similarly, the directive force on board, at the same compass, (Table II,) as deduced from observations entirely independent of those furnishing the deviations and polar force, is proportionally smaller on northerly headings and larger on southerly headings in Beaver Harbor than in Put-in Bay.

These changes in the magnetic forces of the ship, as well as in the compass deviations depending thereon, are undoubtedly attributable to the differences in the earth's magnetic elements consequent upon the change of geographical position.

It will be noticed that the present polar magnetism of the ship is very nearly symmetrical with the mid-ship or fore-and-aft section, as referred to either compass-station fore or aft. This appears from the deviations, of which the neutral points, or points of no deviation, correspond to north and south headings by compass, while the maximum deviations obtain very nearly on the east and west headings. It is also shown by the direction-angles of the polar forces, (Table III;) these forces, while acting in nearly opposite directions, deviating but a few degrees from the midship section.

The influence of the iron steam-cutter, as shown by a comparison of the deviations in Table I, although appreciable, is evidently unimportant.

The original polar magnetism of the Michigan, as developed while she was being built, and its relations to her present condition.—It is to be regretted that we have no records of any early observations on board the Michigan from which we can obtain even a clue to her original magnetic character, and therefrom to the changes which have since taken place. The only record of compass observations, earlier than those of the past season, is that of one complete set for deviations, made in June, 1868, in the harbor of Erie. These were taken with the standard compass, then, as now, on the top of the pilot-house, and in identically the same position. No comparisons at other compass positions on board, nor any observations for force, appear to have been made. The subjoined table gives the deviations on the eight principal headings, from which I have deduced the corresponding magnetic elements, so far as obtainable, without any data from force observations:

Ship's head by standard compass.	Deviations of standard compass.
N.	3.0 E.
NE.	14.5 W.
E.	24.2 W.
SE.	20.2 W.
S.	1.7 W.
SW.	20.3 E.
W.	29.1 E.
NW.	21.9 E.

Magnetic elements.

Polar force—	
Intensity	0.464
Direction angle	174.7
Quadrantal force—	
Intensity	0.023
Direction angle	331.2
Mean equatorial force	0.029 E.

These results, with reference to the fore compass of the Michigan, show that her polar force was decidedly greater five years ago than at

the present time, as found at Put-in Bay. The direction angle also shows that the polar axis of the ship, while nearly as now coinciding with the fore-and-aft section, actually bore a few degrees to the port-side of the ship's head. Probably a small portion of this excess is attributable to the difference in the terrestrial magnetic elements at Erie, as compared with those at Put-in Bay; but the larger part, doubtless, represents the higher magnetic condition of the ship at that time.

In the absence of any observations of an earlier date, we can only infer the probable direction of this ship's original permanent magnetism from a knowledge of her heading while being built. While on the stocks her head was about S. SE., and while subsequently fitting in the dock, about NE. by E. Hence, without more particular information concerning the circumstances of her building and fitting, we may conclude that the original direction of the permanent magnetism, as developed on the stocks, was through her starboard-bow and port-quarter, with south polarity in the former and north polarity in the latter; and that, if this were modified subsequently by the operations of fitting, the direction would have veered more or less to starboard.

But whatever may have been her original magnetic condition, or the changes to which it has been subjected, it appears quite evident that the present general magnetism of the ship is truly shown at the aft compass.

At this compass-station the present direction-angle of the polar force is about a point from her head to starboard, or within a point of coinciding with the fore-and-aft section. But the polar force being composed of both the transient vertical magnetism and permanent horizontal magnetism, and the former being directed from the compass toward the head, it follows that the direction of the latter component must make a still larger though unknown angle from the ship's head than the polar force itself; and consequently, it appears quite probable that the permanent magnetism of the ship continues to have its direction not very different from what it was, as originally developed while the ship was on the stocks. If this be so, it would suggest a remarkable stability, at least in the direction of the ship's permanent magnetism. And it is not altogether improbable in view of the admirable quality of the iron in the hull of the Michigan. I was informed by Commander Brown that, on the occasion of having her hull uncovered for cleaning and painting last spring, it was found in a remarkable state of preservation. It had indentations, and some of them quite large ones, over all parts of the bottom, illustrating the effects of her experiences in frequent groundings; but there was neither fracture nor any very sensible abrasion to be seen.

The polar force at the fore-compass station on the other hand is directed about sixteen points from the head to starboard, or toward her stern, very nearly in the fore-and-aft section. In view of the elevated position of this compass, it is not probable that the component of permanent horizontal magnetism exercises much influence upon it; so that the effect of the large polar force, with an intensity equal to half that of the earth's horizontal force in Beaver Harbor, must be mainly due to the component of transient vertical magnetism developed in the funnel in so close proximity, whose upper part, possessing decided south polarity, strongly attracts the N. point of the compass-card; thus neutralizing half of the earth's directive force on northerly courses, and producing the large left-handed deviations observed at that compass.

Effect of heeling upon compass deviations.—The possible effect upon the deviations of the compass on board an iron ship, while being heeled

or listed over, is often an important question; as it is not an unfrequent occurrence that the deviations, as ascertained with the ship on an even beam, are changed—increased by heeling in one direction, and decreased by heeling in the opposite direction—as much as 5°, 10°, or even 15°, with a heel of but 10°.

In the case of the Michigan, I regret not being able to obtain a few observations, more as a test of theoretical conclusions than from practical considerations, of the effect of heeling in that ship. The attempt was once made; but the ship was well down in the water, (her bunkers being full of coal), and it was found very difficult, with the means at command, to get her over more than two to three degrees. Fortunately, from our knowledge of her heading while being built, and especially with that recently acquired of her actual magnetic condition, we are warranted in concluding that the effects of heeling in her case could not be a matter of much concern.

With the data of our observations, it is easy to compute the *heeling co-efficients*, for both the fore and aft compasses of the Michigan. These are numerical quantities, which depend on the values of certain magnetic elements of the ship, (Table III,) such as the mean northward force, the mean vertical force, and the quadrantal force, but involve, also, as a factor, the tangent of the magnetic dip. Thus, in the present case, we have:

For the standard or fore compass—

Heeling co-efficient in Lake Erie, 0°.09 for each degree, or 0°.9 for 10 degrees of heel.

Heeling co-efficient in Lake Michigan, 0°.11 for each degree, or 1°.1 for 10 degrees.

For the poop or aft compass—

Heeling co-efficient in Lake Erie, 0°.3 for each degree, or 3°.0 for 10 degrees of heel.

Heeling co-efficient in Lake Michigan, 0°.4 for each degree, or 4°.0 for 10 degrees.

In the first case, or at the standard compass, the deviation from heeling would be toward the high or weather side of the ship; in the second case, toward the low or lee side. These are the maximum effects, as found for north or south headings of the ship, which decrease with headings toward the eastward or westward, in the ratio of unity to the cosine of the heading.

These results show that the heeling effect should be hardly appreciable at the top of the pilot-house, and even at the station on the poop not sufficiently so to require attention, except with a large heel on northerly or southerly courses.

Compass treatment on board the Michigan.—It will be evident, I think, from what has already been said, that the positions of the standard and steering-compasses on board the Michigan are very unfavorable, with reference to the magnetic action of that ship. Doubtless, the peculiar experience of the ship makes it expedient to have the helmsman and steering-compass where they now are, in convenient proximity to the station occupied by the pilot; but it would appear that the standard compass might, at least, be more judiciously placed on the poop, where the deviations are comparatively moderate and in normal relations to the general magnetism of the ship. In that case, moreover, the tell-tale in the cabin would always be in close accord with the standard.

With such a disposition of the compasses, the question would properly arise as to the expediency of applying correctors to the steering-compass, in order to free it from the excessive deviations to which it is

now subject. On account of the relatively very small quadrantal force, (Table III,) it would only be necessary to correct for the polar force. This might easily be done by a proper adjustment of fixed magnets; and such would be sufficient if, in the cruises of the Michigan, she never deviated much from the same parallel of latitude. This, however, is not the case of the Michigan, for in her movements through the upper lakes, she not only changes her latitude several degrees, but, as it happens in those waters, she encounters more than a proportional change in the earth's magnetic elements, with a corresponding change in her own magnetic condition. Consequently, fixed magnet correctors would be insufficient; for, while the changes in their action upon the compass would be subject to the same law as the changes in the action of the permanent horizontal magnetism, they would be entirely different from the changes in the transient vertical magnetism; and this component, as previously remarked, is undoubtedly preponderant in the composition of the polar force acting at the pilot-house. The practical result, therefore, would be that, while the compass would remain tolerably well adjusted in Lake Erie, an error might appear in Lake Huron, increasing in amount as the ship traversed the northern waters into Lake Michigan. And such an error, because unsuspected, is always of more serious concern. In fact, I was informed on board the Michigan, that magnet-correctors had been formerly applied to the pilot-house compasses, but that so much confusion resulted in the compass indications, it was deemed expedient soon afterward to remove them.

The proper procedure, in attempting to compensate for the polar force in the Michigan, as in other similar cases, is to provide correctors in part of horizontal magnets, and in part of vertical iron rods; the magnets to equalize that part of the polar force due to the permanent horizontal magnetism, and the vertical iron rods to equalize that due to transient vertical magnetism. But this, unless we know the relative proportions of the two parts, must be a tentative operation, and is liable to lead to uncertain results when the ship goes into distant waters. Hence, whenever it can be done, we should determine, in advance, the relative proportions of the two components of the polar force. Unfortunately, this is not always practicable. Still, it may always be done, with the data easily obtainable from observations at two different places, sufficiently distant apart to furnish decidedly different values of the magnetic dip and relative horizontal force of the earth.

Otherwise, magnets alone may be used as correctors of the polar force; but, in this case they must be movable, and admit of being adjusted from time to time by the navigator, as found necessary from actual observation of the changes in his compass deviations.

I have the honor to be, very respectfully, your obedient servant,

B. F. GREENE,
Professor of Mathematics, U. S. N.,
Superintendent of Compasses.

Commodore DANIEL AMMEN, U. S. N.,
Chief of the Bureau of Navigation, Navy Department.

HYDROGRAPHIC OFFICE, BUREAU OF NAVIGATION,
Washington, August 8, 1873.

SIR: In compliance with the directions of the Bureau, I respectfully submit the accompanying estimates for this Office for the fiscal year ending June 30, 1875.

During the fiscal year ending June 30, 1873, the work of this Office has progressed favorably, though from the want of space and from the small number of available officers, as also from delay in publishing at the Congressional Printing-Office, it has not been expedited as I could have wished. Three books of sailing directions have been published, together with the yearly lists of foreign lights; hydrographic notices and notices to mariners and other manuscript have been completed at this office, and are awaiting publication. Fifty-eight chart-plates have been corrected, and one hundred and nineteen charts prepared and added to the catalogue by the process of photo-lithography, and nine new charts are in process of engraving; there have been sold from this office (to its agents) two thousand eight hundred and seventy of its publications on navigation, &c., and four thousand nine hundred and ninety-two charts, besides the supply issued to the vessels of the Navy.

A party has been organized at this office, and the necessary instruments are being prepared, for the determination, by electric telegraph, of the longitudes of the West India Islands, and the points on the northern coast of South America where the telegraphic cable has been laid; the present longitudes of most of these points are but approximate, and their correct establishment, important geographically and to navigation, entails but a small expense, a great part being for instruments, which are always required at this office.

The work of the survey on the Pacific Ocean by the United States steamer Portsmouth, Commander Skerrett, United States Navy, and the United States steamer Narragansett, Commander Dewey, United States Navy, is well under way. The results of this work will be of great benefit to commerce and navigation. I deem it very desirable that a small vessel should be employed as a surveying vessel in the West Indies, where there is much surveying yet to be done, and that another should be employed in surveys of the channels of commerce in Asiatic waters. Two large tugs would be suitable for the purpose.

Permit me again to ask your attention to the *necessity* of increased accommodations for this office, and to the purchase of a building by the Government for its work, and for the preservation of the valuable material now collected and constantly increasing. The necessity was acknowledged by the Naval Committee of the Senate, at the last session of Congress, and a bill introduced for the purchase and improvement of a building. From the increase of the office this requirement becomes every year more urgent. At present, in the rented building now occupied, there is neither sufficient space for the employés nor for the material. No portion of the building is fire-proof, and consequently it is unsafe for guarding valuable Government property; and the number of rooms, twenty-two, required for the use of this office is too great, I estimate, to admit of the idea that rooms may be found in the building now in course of construction for the Navy Department.

Very respectfully, &c.,

R. H. WYMAN,
Commodore U. S. N., and Hydrographer.

Commodore DANIEL AMMEN,
Chief of Bureau of Navigation.

UNITED STATES NAVAL OBSERVATORY,
Washington, October 9, 1873.

COMMODORE: I have the honor to submit the following report of the work of the Naval Observatory within the past year:

ASTRONOMICAL WORK.

The Equatorial.—This instrument has been employed in making observations of the small planets and comets, and in observing occultations of stars by the moon. The number of the small planets is now so great, namely, 133, and the ephemerides are frequently so much in error, that much time and labor are required to find and observe them. If accurate ephemerides could be provided, such observations would be more easily made with the meridian circle.

Five comets have been observed, three of which are periodical: (1) the periodical comet discovered by Tempel in 1867; (2) the new periodical comet discovered by Tempel on July 3, of the present year; (3) the comet discovered by Borelly at Marseilles, August 20; (4) the comet discovered by Henry at Paris, August 23; and (5) the well-known periodical comet of Brorsen.

The instrument and chronograph are in good working order. The driving-clock, however, attached to this instrument, is of an antiquated pattern, and it appears to be impossible to make it perform as well as we could wish.

The observations have been made by Professor A. Hall and Assistant Observer A. N. Skinner. Mr. Skinner has determined a new value of a revolution of the micrometer-screw, from the observations of stars near the pole.

The zones of stars observed here with the meridian circle in the years 1847, 1848, and 1849 have been printed. They were arranged and prepared for the press by Professor Hall.

The great Equatorial.—The dome for this, the largest instrument of its kind in the world, is now finished and ready for the reception of the telescope, which is nearly completed, and will probably be mounted during the present month—two years in advance of the time specified in the contract with the makers, Messrs. Alvan Clark & Sons, of Cambridgeport, Mass.

Transit instrument and Mural circle.—With the exception of a few nights' work with the transit instrument, Prof. M. Yarnall has been engaged in observing with the mural circle. The stars observed were such as were supposed not sufficiently observed in the catalogue just published. Professor Yarnall has finished the computations on the catalogue, and, with the assistance of Mr. Skinner, has read the proof-sheets of it as they passed through the press. With Mr. Skinner's assistance, he read the proof-sheets of the volume for 1871, which is about to be issued from the press. He has, with the assistance of Mr. Skinner and Professor Lockwood, reduced the observations made with the mural circle in 1872; except copying, the observations with the mural circle for that year are now ready for the printer. He has also reduced nearly half the stars observed in the current year with mural circle.

The Transit circle.—This instrument is in charge of Professor William Harkness, assisted by Professor J. R. Eastman, and Assistant Observers Edgar Frisby and Ormond Stone. Early in April, Professor Edward S. Holden reported at the Observatory, and on the 15th of that month, he also was assigned to duty as an ssistant on this instrument. It has been employed on the sun, m and planets, and on a large list of miscellaneous stars, whose places were required for the reduction of observations made with the equatorial, as zero-points for the formation of a catalogue from the zone observations made here in the years 1846 to 1849; and for the use of Lieut. G. M. Wheeler, of the United States Engineers, in the reduction of the zenith-telescope work of his parties

engaged in surveying and exploring the Western Territories. Only so many nautical-almanac stars have been observed as were necessary for the determination of time and azimuth. Owing to the prevalence of cloudy weather to an almost unprecedented extent, the number of observations will probably be somewhat less than the average. Advantage has been taken of this circumstance to bring up the computing, which was considerably in arrears.

The condition of the transit circle is very satisfactory; no changes of any importance have been made either in it or in any of its subsidiary apparatus. The only things which have given any trouble are the shutters which close the observing slit, and it will be necessary to make extensive alterations in them before they will work properly.

Theory and tables of the moon.—Since the date of the last annual report, the first part of Professor S. Newcomb's investigation of the moon's motion has been nearly completed and prepared for the press, according to the original plan. But, on examing certain terms troublesome to calculate, which it was supposed were entirely unimportant, it was found that this supposition was erroneous, and that the work could not be properly completed without them. The preparations for observing the transit of Venus have not allowed Professor Newcomb the period of uninterrupted study necessary for this calculation, which, therefore, remains unfinished. The computations for the second part of the work have been carried as far as they can be carried without the star denominations mentioned in my last report; and these cannot be obtained until the observations are completed and reduced. It is hoped that after the preparations for observing the transit of Venus are completed, both parts of the work will be speedily finished and prepared for publication.

Transit of Venus.—The details of the preparations for the observation of the transit of Venus devolving upon the officers of the Observatory, composing a majority of the members of the Commission authorized by Congress, have occupied a large portion of the time of those officers, in addition to their routine duty. The work progresses favorably, and the expeditions are expected to leave for their stations early next June.

TELEGRAPHIC APPARATUS, ETC.

The telegraphic apparatus, in charge of Professor Harkness, assisted by Mr. William F. Gardner, the instrument maker, continues in excellent order, and has been much extended. As usual, the fire-bells in the city have been struck every day at 7 a. m., 12 m., and 6 p. m.; the time-ball on the dome of the Observatory has been dropped daily at noon; and time-signals have been sent to the main office of the Western Union Telegraph Company at the same instant. The distribution of these signals by the telegraph company has of late been greatly extended. Formerly they were confined to the region of country between the Atlantic Ocean and the Mississippi River, and Baltimore and the Gulf of Mexico; but now our signals go directly from the Observatory to the main office of the company in New York City, and from thence they are distributed to nearly every State in the Union. The immediate object of these signals is to furnish accurate and uniform time to the railroads; and, throughout the whole of the vast territory in question, there is scarcely a train whose movements are not regulated by the Observatory clocks.

The clocks at the Navy Department, and at the Army Signal-Office, controlled from the Observatory, have continued to perform in such a

satisfactory manner that the system has attracted attention, and there is a prospect that it will soon be extended to all the principal Government offices in this city. Early last spring, the Treasury Department decided to procure a clock similar to that in the Army Signal-Office, and it was placed in position and connected with the Observatory wire on May 16. Since then it has been running very well. The Western Union Telegraph Company have also placed a similar clock in their main office in this city, in order to facilitate their distribution of time-signals to the railroads.

The new main switch-board, for which an appropriation was made last winter, has been ordered, and it will soon be ready for use. It will be capable of receiving 110 wires, and will facilitate very much the management of our telegraphic apparatus. No longitude operations have been undertaken during the year.

METEOROLOGICAL OBSERVATIONS.

In the meteorological department, in charge of Professor Eastman, the regularity of the observations has been maintained; and the usual observations with the barometer, dry, wet, and solar thermometers, have been made at 0^h, 3^h, 6^h, 7^h, 9^h, noon, 3^h, 6^h, 9^h, on each day. The observations for 1871 have been prepared for the press, and are now in the hands of the printer; and the observations of 1872 are also ready for printing. Cloudy weather prevented observation of the meteors of November 14, but those of November 27 were observed. A few meteors were observed on the night of August 10; but it is probable that the thickest part of the stream passed before the 10th.

CHRONOMETERS.

Ten large compartment cases, capable of accommodating in all two hundred and two chronometers, occupy the center and sides of the chronometer-room, with the standard mean-time clock and its telegraphic connections. In the receiving cases are, at this date, seventy-six chronometers by different makers, from which careful selections are made with reference to the station to which the vessel to be supplied is assigned. These instruments are wound and compared with the mean-time standard, daily. Their differences are entered on the comparison forms, and their rates and the mean temperature of the cases in the chronometer journal every tenth day, and on the "trial" forms for six months or a year, consecutively, as they are tested for repairs, or under trial for purchase. The rule, in each instance, is the severe one of applying twice the difference between the greatest and least rates during the entire period to the mean of the monthly variations, and rejecting those in excess of eight seconds. Fifty-three of these instruments have been under six months' trial since last report, forty-nine of which came within the limit required, under the mean annual temperature of 76° Fahrenheit, four only being rejected. There are now under trial, and due this year, twenty-three box-chronometers. The result of trials fully sustains the high reputation of the instruments made by the Messrs. Negus, of New York City, for accuracy and regularity of performance under variations of temperature; and the repairs put by them on the chronometers belonging to the Navy have proved satisfactory.

Since October, 1872, there have been received from all sources eighty-three box and five pocket chronometers, and sixteen silver comparing-watches; fifty-six have been issued by order of the Bureau to vessels

and hydrographic surveying expeditions, seventy-nine box and three pocket chronometers have been sent to the maker for cleaning, recompensation, and repairs, and five box-chronometers have been withdrawn from service as unreliable instruments in navigation.

The officers who have been on duty in the chronometer department from the date of last report to date of detachment, respectively, are as follows: Commander James H. Gillis, (in charge,) to April 25; Commander W. W. Queen, to June 23; Lieut. F. W. Greenleaf, to August 25; Master Albert Ross, to March 31. The officers on duty at present are: Commander A. W. Johnson, since May 2, (in charge;) Lieut. Commander S. W. Terry, since July 10; Lieut. Isaac Hazlett, since November 1, 1872; Lieut. Lambert G. Palmer, since October 1, 1873.

In addition to the routine duty of winding, comparing, and computing rates, temperatures, and trials, selecting chronometers for issue, as they are ordered by the Bureau, and having them cleaned and repaired at the proper time, the collation of the history of each from the date of its manufacture and purchase has so far advanced as to show the length of service of nearly all the chronometers belonging to the Navy, the repairs put upon each one at various times, the dates when cleaned and re-oiled, the comparison of the numbers obtained by repeated trials, and the performance of each in the past and its reliability for the future. A tabular abstract of the chronometers on hand for each month, which supplies a ready and convenient index to the volumes, rates, histories, and "trial" papers, has been recently introduced, and is found to be of great usefulness in securing method and accountability. A paper embracing the details of this service is in course of preparation for the instruction and guidance of officers who may be hereafter assigned to duty in this department of the Observatory.

From the chronometer room the daily time signals are sent, and the noon-time ball dropped by the telegraph wires.

The instrument-maker, Mr. Gardner, is charged with keeping in working order the astronomical instruments, batteries, &c., and he gives attention, in assisting Professor Harkness, to the telegraphic connections of the motor-time standard at the Observatory.

In the estimates submitted for the coming year an appropriation is asked for to cover the cost of a chronometrical thermometer, for use in the chronometer room. This instrument is compensated to run on mean-time under a known temperature, showing by its gain or loss in any given interval the mean temperature of its locality, and it furnishes the means of determining the daily rates of chronometers in the order of temperature. Such an instrument has been long employed for this purpose in the royal observatory at Greenwich, and it affords a more accurate measurement of temperature than the self-registering thermometer.

THE LIBRARY.

The increase of the library continues to be chiefly through its home and foreign exchanges. This increase has been steadily maintained. A few astronomical and mathematical works of the highest character have been recently purchased.

The demands for our annual volumes, and for their special treatises published separately in appendices, have been liberally answered. Of the seven hundred copies of the astronomical and meteorological observations made during the year 1870, and received from the Government Printing Office in April last, less than one hundred copies remain as a reserve for special calls. Fifty copies were retained from the Ob-

servatory, as usual, to be placed at the disposal of the Library of Congress for their exchanges.

Besides the annual volume for 1870, three of the four appendices of the volume for 1871, (now in press,) have been issued separately in advance, and have been mostly distributed, viz: No. II. Results of Washington Observations from 1853–'60; No. III. Catalogue of Stars Observed from 1845–'71; No. IV. Memoir of Founding and Progress of the Observatory. The first of these represents part of the astronomical work during the years named, for which years no volume had previously issued from the Observatory. Other work of those years is now being prepared for publication. The second appendix named above (No. III) is a star catalogue, embracing between 80,000 and 90,000 observations made by Professor Yarnall—the results of his labors of more than twenty years—giving the places of more than 10,000 observed stars.

Appendix No. I for this volume, "Zones of Stars Observed with the Meridian Circle in the years 1847, '48, and '49, by Professor Major and Lieutenants Maynard and Muse," is early expected from the Congressional Printer for distribution.

PUBLICATION OF RESULTS.

Observations to be of any value to the world must be published; if they are not, the time and labor spent upon them are simply wasted. And yet they are so much more easily made than reduced, that nothing is more common than to see them lie for years before the computations necessary to fit them for publication are completed. The warm interest which the Bureau has taken in the Naval Observatory has enabled me to resuscitate from our store-rooms the zones of stars observed here from 1846 to 1849, and those observed by Capt. J. M. Gilliss, in Chili, from 1850 to 1852. The former have been already issued in form of appendices (Nos. II and IV) to our annual volumes for 1869 and 1870; and considerable progress has been made in forming a star catalogue from them. An appropriation having been made by Congress last winter for finishing the reduction of Captain Gilliss's zones of stars observed in Chili, they are now in such a state of forwardness that the resulting star catalogue will appear in our volume for 1873. Thus it will be seen that nearly all the valuable observations which were locked up in the archives of the Observatory have been given to the world.

I have made it my constant endeavor to bring everything up to date. Under the most favorable circumstances, the annual volume of observations cannot be issued in less than about sixteen months after the expiration of the year to which it belongs. The volume for 1871 is now printed, and as soon as it can be bound it will be ready for distribution. Our current work is, therefore, only about six months in arrears.

Very respectfully, your obedient servant,

B. F. SANDS,
Rear-Admiral, Superintendent.

Commodore DANIEL AMMEN, U. S. N.,
Chief of Bureau of Navigation, Navy Department.

NAUTICAL ALMANAC OFFICE,
Washington, D. C., October 17, 1873.

SIR: I have the honor to submit the following report of the operations of this Office during the past year:

The preparation of the American Ephemeris and Nautical Almanac

has continued, as in previous years, without change in the means and methods employed, except that the tables of Uranus, prepared by Prof. S. Newcomb, United States Navy, have been substituted for those previously used.

The ephemeris for each year comprises all relating to the places of the sun, moon, principal planets, and standard stars, with predictions of eclipses and occultations, that is desired by astronomers in such a work. The demand for it has increased, so that during the past year nearly 350 copies have been sold, and more than 1,100 copies have been distributed to the ships and stations of the Navy, to the surveying and exploring parties of the Army, the Coast-Survey and the Land-Office; to observatories and astronomers, and to various colleges and other public institutions, especially to those in which astronomical observations or investigations are conducted.

A smaller volume, containing the first half of the complete ephemeris, is published for the use of navigators. More than 4,000 copies of the almanac of each year are required for the supply of merchant ships.

There have been printed during the year 100 copies of the ephemeris for 1873; 700 of the ephemeris for 1874; 495 of the ephemeris for 1875; 500 of the ephemeris for 1876; 300 of the small almanac for 1873; 3,000 of the small almanac for 1874; 1,000 of the small almanac for 1876; and 200 of tables of Venus.

The ephemeris for 1875, at the time of my last report stereotyped and ready for the press, was received from the printer early in November of last year. The small volume for 1876 was received in April, and the complete ephemeris for that year early in September of the present year.

The greater part of the ephemeris for 1877 is in the hands of the printer, and it is expected that the entire volume will be prepared before April next. The ephemeris of the sun and a portion of that of the moon, for 1878, have also been prepared.

Arrangements have been made for the computation of tables and ephemerides of twenty-six of the thirty-nine small planets discovered by American astronomers. It is very desirable that the small appropriation for that purpose should be renewed for the next fiscal year.

I have already submitted estimates for that year.

I am, very respectfully, your obedient servant,

J. H. C. COFFIN,
Prof. Mathematics, U. S. N., Superintendent.

Commodore DANIEL AMMEN, U. S. N.,
Chief of Bureau of Navigation, Navy Department.

BUREAU OF NAVIGATION, SIGNAL-OFFICE,
Navy Department, Washington, October 30, 1873.

SIR: I have the honor to report that the duties of this Office, since I relieved Commodore Almy as chief signal-officer of the Navy, on July 1, have been confined to the preparation of a tactical signal-book, which is now in course of publication, and which, it is believed, will meet a want long felt in the Navy.

Very respectfully, your obedient servant,

FOXHALL A. PARKER,
Commander United States Navy.

Commodore DANIEL AMMEN, U. S. N.,
Chief of Bureau of Navigation, Navy Department.

Estimate of appropriations required for the service of the fiscal year ending June 30, 1875, *by the Bureau af Navigation.*

FOR THE SUPPORT OF THE BUREAU OF NAVIGATION.

For salary of chief clerk, (act approved July 5, 1862, section 3)	$1,800
For salary of one clerk of third class, (act of July 23, 1866, section 8, and July 12, 1870, section 1)	1,600
For salary of one clerk of second class, (act of July 23, 1866, section 8, and July 12, 1870, section 1)	1,400
For salary of messenger, (act of July 5, 1862, and proviso of March 3, 1869)	840
For salary of laborer, (act of February 25, 1863, and proviso of March 3, 1869)	720
For contingent expenses	800
Total	7,160

A.

1. FOR NAVIGATION.

For foreign and local pilotage, and towage of ships-of-war	$50,000
For services and materials in correcting compasses on board ship, and for adjusting and testing compasses on shore	3,000
For nautical and astronomical instruments, nautical books, maps and charts, and sailing-directions, and for repairs of nautical instruments for ships-of-war	10,000
For books for libraries of ships-of-war	3,000
For Navy signals and apparatus, namely, rockets, signal lights and lanterns, including running-lights, and for drawing and engraving for signal-books	6,000
For compass-fittings, including binnacles, tripods, and other appendages of ships' compasses	5,000
For logs and other appliances for measuring the ship's way; for leads and other appliances for sounding	5,000
For lanterns and lamps, and their appendages, for general use on board ship, including those for cabin, ward-room, steerage, holds, spirit-room, and for deck and quartermasters' use	5,000
For bunting and other materials for flags, and for making and repairing flags of all kinds	6,000
For oil for ships-of-war, other than that used in the engineer department; for candles when used as a substitute for oils in binnacles and running-lights; for chimneys and wicks; and for soap used in the navigation department.	22,000
For stationery for commanders and navigators of ships-of-war	4,000
For musical instruments and music for ships-of-war	1,000
For steering signals and indicators, and for speaking-tubes and gongs for signal communication on board ships-of-war	2,500
Total	122,500

2. FOR CIVIL ESTABLISHMENT.

For civil establishment in the navigation department at the several navy-yards	$20,000

3. FOR NAVIGATION CONTINGENT.

For freights and transportation; postage and telegraphing on public business; advertising for proposals; packing-boxes and materials; and all other contingent expenses	$6,000

4. FOR NAVIGATION, HYDROGRAPHIC WORK.

For drawing, engraving, and photo-lithographing charts, correcting plates, preparing and publishing sailing-directions, and other hydrographic information	$20,000
For making charts, including those of the Pacific coast	30,000
For fuel, lights, and office-furniture; care of building, and other labor; purchase of books for library; drawing-materials, and other stationery; postage, freight, and other contingent expenses	7,000
For rent and repair of building	2,800
Total	59,800

B.

1. FOR NAVAL OBERVATORY.

For one clerk	$1,800
For three assistant observers, at $1,500 each	4,500
For wages of one instrument-maker, three watchmen, one messenger, and one porter; keeping grounds in order, and for repairs of buildings and inclosures; for fuel, lights, and office-furniture; purchase of books for library, and chemicals for batteries, stationery, freight, and all other incidental expenses	13,500
For transcribing astronomical observations for publication	1,200
For one chronometrical thermometer, (submitted)	550
For painting buildings and fences, (submitted)	1,000
Total	22,550

2. FOR TOWER FOR TELESCOPE.

For purchase of furniture and equipments for the new building for great telescope	$2,000

3. FOR REFRACTING TELESCOPE.

For last payment for great refracting telescope in course of construction	$10,000

C.

1. NAUTICAL ALMANAC.

For pay of computers and clerk for preparing for publication the American Ephemeris and Nautical Almanac	$20,000
For continuance of work on new planets discovered by American astronomers	3,000
For rent, fuel, labor, stationery, boxes, expresses, and miscellaneous items	1,500
Total	24,500

RECAPITULATION.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1875, by the Bureau of Navigation, Navy Department.

FOR SUPPORT OF BUREAU.

Salaries and contingent	$7,160

FOR THE NAVAL SERVICE.

A.—1. Navigation	$122,500
2. Civil establishment	20,000
3. Navigation contingent	6,000
4. Hydrographic work	59,800
B.—1. Naval Observatory	22,550
2. Tower for telescope	2,000
3. Refracting telescope	10,000
C.—Nautical Almanac	24,500
	267,350

No. 6.

BUREAU OF ORDNANCE.

BUREAU OF ORDNANCE, NAVY DEPARTMENT,
November 1, 1873.

SIR: I have the honor to submit the annual report of this Bureau, with accompanying estimates for the fiscal year ending June 30, 1875.

While engaged in the ordinary duties of preparing ships for sea-service, supplying their requisitions while abroad, and preserving the public

property under its charge, the Bureau has not been unmindful of the very important questions connected with the armament of ships of war, nor of new means for offense and defense, in order that we may keep pace with the work of other nations.

The appropriations for experimental purposes were so far limited as to prevent the Bureau from making full investigation of many devices and theories which have either originated here, or were brought to public attention abroad.

A very large amount of information, nevertheless, has been collected, and arranged for future reference whenever opportunities may be afforded for experiment; and within the scope of the expenditures allowed by Congress much has been done in the way of preliminary inquiry.

The small battery near Annapolis is gradually being brought into working order, and during the next season will be in readiness for efficient experimental work.

It has been supplied with the best apparatus for observing ranges and velocities; it can also afford heavy practice against armor-plating, when required.

The solution of the powder question in respect to the relation of velocities to pressures, first prominently brought forward by General Rodman, remains the most important, and therefore receives special attention. It is one in which theories are of no avail. Experiment alone can determine the qualities required in different guns, and I have pleasure in informing the Department that the most satisfactory results have been obtained in this direction.

While seeking to obtain the highest velocity due to a given charge of powder, care must be taken to reduce to a safe limit the rupturing force, and to make them uniform in their action. To this end a series of experiments in the manufacture of powder, particularly the large-grained for heavy cannon, were instituted by my predecessor, and continued under my direction, at the Annapolis battery, in conjunction with the mills of the Messrs. Dupont, near Wilmington, Del. These have enabled us thus far to produce a powder which gives with substantial uniformity in the 15-inch a velocity of 1,800 feet, with a pressure of not more than 30,000 pounds per square inch upon the bore of the gun. These experiments have not only shown that the size of the grains should vary with the caliber, but have determined the limits of density, and have shown the importance of certain details in the manufacture hitherto neglected. This improvement upon the old manufacture may be understood from the fact that the samples of a lot of mammoth-grain powder (5 barrels taken indiscriminately from 1,000) fired July 8, 1872, gave (in charges of 100 pounds) irregular velocities and pressures, respectively, of 1,468 feet by 31,000 pounds; 1,500 feet by 57,500 pounds; 1,504 feet by 43,500 pounds, &c.

The effect of such variable propelling forces and strains upon the ranges and endurance of cannon may be readily imagined. They are extremely prejudicial to guns of any kind, but particularly dangerous to the cast-iron ordnance of our Navy. Wherefore it may be said that their safety is insured proportionately with the uniformity attained in the action of the powder used in them; the object being high velocities and low pressures. The best results are obtained with grains of definite form, regular surface, and uniform density. A simple method of securing this, which I proposed, has been adopted. Charges made of these hexagonal grains, weighing 100 pounds, were fired from a 15-inch smooth-bore gun, on the 20th of August, 1872. They gave velocities and pressures, respectively, of 1,644 feet by 28,500 pounds; 1,635 feet by

32,500 pounds, and 1,611 feet by 32,000 pounds. In the solution of this important question a friendly rivalry is maintained by the Army authorities, an example of which is shown in the following extract from an official report just made, and kindly sent me by the Chief of Ordnance. In this instance a 12-inch cast-iron rifle was used in firing the hexagonal grains.

	Charge.	Weight of shot.	Pressures.	Velocities.
1	110 pounds	600	37,000	1,368
2	110 pounds	600	37,000	1,364
3	100 pounds	650	29,000	1,272
4	100 pounds	650	37,000	1,272
5	80 pounds	700	25,000	1,154
6	90 pounds	700	28,000	1,195
7	100 pounds	700	38,000	1,272

In connection with the work upon powder for large cannon, I have also instituted experiments with the finer grains for the metallic cartridges of small-arms. In these experiments are embraced the details relating to the development of a perfected system of ammunition for the breech-loading small-arms of the Navy, and to serve also for the Gatling guns, which now form part of the equipment. The failures experienced by our seamen and marines, under very trying circumstances, in the Corea, from defective ammunition, drew attention to the absolute necessity of having a cartridge upon the keeping-qualities of which, in the moist and heated atmosphere of a ship's hold in tropical climates, the utmost reliance could be placed.

To this end my predecessor, Admiral Case, directed a searching examination of the subject to be made without delay, and from various specimens of cartridges, selected the solid-head cases, made by the United States Cartridge Company, at Lowell, Mass., for trial; not only because they exhibited excellent workmanship, but that they seemed to have the best method of reloading, an essential element in naval small-arm ammunition. With the limited quantity required for naval purposes, this Bureau does not consider it expedient to set up machinery for its manufacture, but prefers to rely on the competition of private establishments. Therefore it detailed an officer to maintain a special supervision and inspection of the work in every stage of its progress, from the preparation of the sheets of metal to the finished cartridge, ready for service. This duty has been performed in the most satisfactory manner, the people of the factory aiding the Bureau with signal ability; and the success of these joint efforts was shown in some recent practice made from a Gatling gun, during which 100,000 of these cartridges, brass cases, with solid heads, containing 70 grains of powder and a bullet of 450 grains, were fired with the following results:

Failed to extract after the cartridge exploded	0
Burst heads	0
Failed to explode on first effort, and from all causes	46

In no instance was there an escape of gas in the rear.

During the whole of the trial the gun was not impeded by any failure of a cartridge. On the first day 4,000 cartridges were fired with extreme rapidity, in 15′ 8″; and on the second day, 60,000 in succession, without stopping to clean the gun. After the sixty thousandth round

no appreciable difference was observed in the working of the gun, nor in its ability to deliver its fire with certainty and satisfactory accuracy. Cartridge-cases which had been reloaded 100 times each were found to be in excellent condition.

It will be observed that the percentage of failures to explode is extremely small; and no heads were burst; nor did any cartridge fail to extract, which is the most important element in a metallic case required for use in both the rifle and Gatling gun.

THE GATLING GUN

Exhibited qualities of precision, rapidity of fire, and endurance exceedingly remarkable. So much has been said concerning these pieces that it would be idle to repeat the details. The general opinion among ordnance men is, that it will never entirely supplant the guns of light batteries, nor the boat-howitzers of the Navy. As an auxiliary, however, to the latter on board ship, and in dangerous boat operations, such as disembarking or embarking bodies of men in the face of an enemy, its value cannot be overestimated.

During the experiment at Annapolis, above recited, several modifications in the feed-drums, or cases, were suggested, by which the rapid delivery of the cartridges in firing might be facilitated. These will be supplied as soon as they can be made, and then tested in service.

In the artillery operations of the Franco-German war, breech-loading rifled field-pieces were used by the latter in all the battles which occurred; and there is little doubt of their having performed an important part in every engagement in which they were brought into play.

Whether, under similar circumstances, an equal number of muzzle-loaders, properly served, might not have done as well, is perhaps an open question. It is sufficiently obvious, however, that there are many advantages peculiar to breech-loaders which warrant their use in naval light artillery, as well as for heavy guns of a battery. Therefore the Bureau is now engaged in preparing for experimental firing two guns, both intended to use metallic cartridge-cases, which, in its judgment, are preferable for naval guns of small caliber. One of these is to be made after the designs of Mr. B. B. Hotchkiss, of New York, as a gun of the kind has already been subjected to trials in France with satisfactory results.

The advantage of using a cartridge-case lies in having a gas-check renewable at every round; and in the guns in question the arrangements of the breech for loading, closing, and extracting the empty cases are very simple.

TORPEDO STATION.

The report of examination of officers under instructions in torpedo service at Newport, made in compliance with the Department's orders, of date the 26th June, 1873, is hereto appended. It gives a very clear impression of the condition to which this particular branch of the ordnance service has been brought under the system inaugurated by my predecessor.

The necessity of maintaining this station, and utilizing it as a school in which officers may be trained in the details and exercises of torpedo warfare, needs no argument. It is, however, to be regretted that but one commanding officer has availed himself of its advantages, others being apparently content to take their instruction at second-hand from junior officers under their command. For this reason it has not reached all the development of which it is susceptible. Recent advices from

our ships composing the European fleet inform me that no difficulties are experienced in firing improvised torpedoes in rapid succession The items of appropriations for torpedo purposes are strictly observed in the expenditures.

The more pressing demands of the service, I regret to say, has caused the withdrawal of the Constellation from duty as the ordnance practice-ship.

The Department having discontinued the station of Mound City, Ill., all the ordnance property of any value has been transferred from thence to the navy-yard at Pensacola, where the improvements for ordnance purposes authorized by the act of May, 1872, are very nearly completed.

Finally, the Bureau is about to take the preliminary steps for the removal of the naval magazine in this city, as authorized and appropriated for by Congress at its last session.

The accompanying estimates have been carefully prepared and revised, and are believed to be as low as the necessities of the ordnance service will permit. I may remark, however, that whenever Congress may think proper to authorize the construction of heavy rifled-guns, and their equipment, the Bureau will be prepared with the necessary plans; and the inventive genius and mechanical skill of our people will doubtless be found sufficient for the task.

I have the honor to be, with high respect, your obedient servant,

WILLIAM N. JEFFERS,
Chief of Bureau.

Hon. GEORGE M. ROBESON,
Secretary of the Navy.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1875, by the Bureau of Ordnance, Navy Department.

Detailed objects of expenditure, and explanation.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1874.
SALARIES.		
Chief clerk, per act of July 23, 1866, (14 Stat. at L., p. 207, sec. 8)	$1,800 00	
Draughtsman, per act of March 2, 1867, (14 Stat. at L., p. 450, sec. 1)	1,800 00	
One clerk of class three, per act of July 12, 1870	1,600 00	
Two clerks of class two, same act	2,800 00	
One messenger, per acts of July 5, 1862, (12 Stat. at L., p. 511, sec. 3, and March 3, 1869, 15 Stat. at L., p. 287, sec. 1)	840 00	
One laborer, per act of July 12, 1870	720 00	
Total	9,560 00	$9,560 00
CONTINGENT EXPENSES.		
Stationery, books, and miscellaneous items, appropriated, (17 Stat. at L., p. 502, sec. 1)	800 00	800 00
ORDNANCE AND ORDNANCE STORES.		
Fuel and materials necessary in carrying on the mechanical branches of the Ordnance Department of the several navy-yards, (appropriated, 17 Stat. at L., p. 548)	118,713 00	
Labor at navy-yards, (appropriated, 17 Stat. at L., p. 548)	306,838 00	
Repairs to ordnance buildings, magazines, gun-parks, machinery, &c., (appropriated, 17 Stat. at L., p. 549)	56,378 00	
Miscellaneous items, freights, &c., (appropriated, 17 Stat. at L., p. 549)	12,271 00	
Total	494,200 00	493,751 00

Estimates of appropriations required for the Bureau of Ordnance, &c.—Continued.

Detailed objects of expenditure, and explanation.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1874.
IMPROVEMENTS, AS FOLLOWS, VIZ:		
Magazine, Norfolk:		
Shed on wharf for loading and unloading shell, (submitted)	$ 102 71	
Powder-boat, (submitted)	6,000 00	
Force and lift pump, (submitted)	42 00	
Total	6,144 71	$110,933 00
TORPEDO CORPS.		
Purchase and manufacture of gunpowder, nitro-glycerine, gun-cotton, &c., (appropriated, 17 Stat. at L., p. 549)	20,000 00	
Purchase and manufacture of electrical machines, galvanic batteries, and insulated wire, including the erection of a building for purposes of instruction in electricity, (appropriated, 17 Stat. at L., p. 549)	24,000 00	
Purchase of copper, iron, wood, and other materials necessary for the manufacture of torpedoes, with work on same, (appropriated, 17 Stat. at L., p. 549)	27,000 00	
Construction of torpedo-boats, purchase of coffer works or bulks, and contingent expenses, (appropriated, 17 Stat. at L., p. 549)	50,000 00	
Repairs to buildings and wharves, (17 Stat. at L., p. 549)	5,000 00	
Labor, including chemist, electrician, pyrotechnist, machinists, watchmen, &c., (appropriated, 17 Stat. at L., p. 549)	25,000 00	
Total	151,000 00	123,765 00
CIVIL ESTABLISHMENT.		
Pay of superintendents and the civil establishment at the several navy-yards under this Bureau, (appropriated, 17 Stat. at L., p. 549)	15,000 00	15,000 00
CONTINGENT.		
Contingent expenses of the ordnance service of the Navy, (appropriated, 17 Stat. at L., p. 549)	1,000 00	1,000 00

No. 7.

BUREAU OF MEDICINE AND SURGERY.

NAVY DEPARTMENT,
Bureau of Medicine and Surgery, November 1, 1873.

SIR: Herewith I have the honor to submit the report of the operations of this Bureau for the past year, with such suggestions as, in my opinion, are calculated to promote the efficiency of the medical service of the Navy.

NAVAL HOSPITALS.

During the summer the usual visit of inspection was made to several of the principal hospitals of the Navy, and to the United States Naval Laboratory, at Brooklyn.

The hospital at Portsmouth, N. H., stands within the navy-yard, and is an old and dilapidated building, in all respects inadequate to the purposes for which it is used. It should at once be demolished, and a suitable structure erected elsewhere. An advantageous site can be obtained beyond the limits of the yard, and a small though commodious hospital built at a moderate cost. For this object an appropriation of

$65,000 would be required. If, on examination, a good site could be found on ground now belonging to the Government, a somewhat smaller sum would suffice.

The Quarantine Hospital on Wood's Island, at the entrance to the harbor of Portsmouth, has been put in good order, at a cost of $2,000, and is now ready for the reception of the class of patients for whom it was designed. Being constructed on a mere ledge of rocks, its situation has been regarded as precarious; and though believed to be well secured by its present fastenings, it has once been nearly washed away, and the occurrence of an unusually heavy gale would excite solicitude for its safety. For this reason, if the preceding suggestion for the erection of a new hospital should be carried into effect, provision, at the same time, might be made, without much if any additional cost, for the construction of a quarantine building at a suitable distance from the former.

The hospital at Chelsea, Mass., having of late years had but little expended on it, except to meet demands of the most pressing kind, is now in want of considerable repairs; but it is not believed that any special appropriation will be needed for this purpose.

The hospital at New York is far from being in as good condition as could be desired. It is the most important establishment of the kind belonging to the Navy, and to maintain its efficiency will soon need general renovation and extensive repairs.

So little has been expended on the Norfolk hospital since its recovery by the Government that it has fallen into a dilapidated state, and is now in urgent need of repairs to preserve it from decay. A year ago a thorough inspection of the building and appendages having been made by a board composed largely of experts, the cost of the repairs found by them to be absolutely necessary was estimated by the civil engineer of the Norfolk navy-yard—himself a member of the board of inspectors—to amount to $32,649.55. Although it is not proposed to recommend the expenditure of so large a sum, this estimate by a practical man who had acquainted himself with the details of the work to be done, is mentioned here to show the actual condition of the establishment, as well as the pressing need of something being done for its preservation.

The hospital at Philadelphia requires no special appropriation, but can be kept in its present condition out of the resources ordinarily at the disposal of the Bureau.

I respectfully beg to renew a suggestion made by my predecessor, in his report of last year, that an appropriation of $50,800 is required to construct surgeon's quarters, drains, roads, water-pipes, &c., at the naval hospital, Mare Island, California.

The hospital at Pensacola, Fla., having been destroyed at the outset of the rebellion, the wants of the station since have been supplied, though to a very imperfect extent, by the use of a small wooden building hastily put up in the navy-yard during the war.

The building has long been felt as an inconvenience by the other departments of the yard, and on every account is unfit to be maintained any longer in its present position. Pensacola is necessarily a most important station in the Gulf of Mexico; and, from the preponderance of our national interests in the adjacent waters, may at any moment become of still greater importance. A commodious hospital is greatly needed at this point, and I therefore urgently recommend that immediate steps be taken for its erection. For this purpose the sum of $100,000 will be required.

The naval hospital at Yokohama, Japan, being constructed of perishable materials, constantly calls for repairs.

Its enlargement will also soon become a matter of prime necessity. Being designed for the reception of merchant as well as naval seamen, our increasing commercial interests in those seas will not much longer be satisfied with the accommodations it now affords. To meet present, and provide for future wants, the small sum of $5,000 will be required.

Last year the sum of $25,000 was appropriated by Congress for "repairs and improvements of hospitals;" but my own observation, supplemented by the experience of medical officers in charge, convinces me that it was much too small. The sum now estimated for this purpose, though an increase on that of last year, will only be sufficient to execute necessary repairs, and to place these receptacles for the sick and wounded of the Navy on a respectable footing.

Without the least extravagance in fitting up, it is gratifying to know that most of the naval hospitals are now reasonably well provided with appliances for the care and comfort of the sick, so that no unusual expenditure will be required on this head. It is true the grounds and cemeteries of all of them would be improved by an increased expenditure at each, but although in this respect they are far behind our civil establishments, I do not propose applying to this end the money so imperatively needed for objects of greater importanee.

NAVAL HOSPITAL FUND.

The financial condition of the Bureau demands, as I no doubt it will receive, your earnest consideration.

The naval-hospital fund, on which dependence is placed for the maintenance of hospitals, is nearly exhausted. The annexed table, marked C, explains its condition. While on October 1, 1872, it amounted to $73,910.04, on October 1, 1873, it had declined to $18,663.35. The difference, $55,246.69, represents the drafts, in excess of newly accruing credits, made on the fund last year for the support of hospitals. As the average annual disbursement for this object during the years 1869–'70–71–'72 was $127,913.95, to maintain the same unavoidable scale of expenditure, an appropriation will hereafter become necessary. To make up this deficiency for the remainder of the present fiscal year, $50,000 will be required, and for next year $100,000.

A few words of explanation will show why the fund has become so greatly reduced. On the 1st of January, 1869, the naval-hospital fund amounted to the large sum of $421,044.12. This, with additions regularly made to it from year to year, under the act of February 26, 1811, would long have been ample for the support of hospitals. During the years 1869, 1870, 1871, 1872, the sum of $217,852.80, belonging to the fund, was applied to the construction of the hospitals at Mare Island and Annapolis. Add to this the amount taken out of it annually for ordinary hospital purposes, and it will be seen that its exhaustion was necessarily only the work of a few years.

MEDICAL CORPS.

The present condition of the medical corps of the Navy is well calculated to excite uneasiness as to its future. There are now thirty vacancies in the grade of assistant surgeons, and resignations are still pending. Already the Bureau finds considerable embarrassment in procuring medical officers for the duty to be performed. But few candidates for admission present themselves before the medical board, and of these not more than one-fourth are found qualified for a commission. This result

is not owing to any unusual strictness in the examinations, but to the want of the necessary qualifications on the part of candidates. The proof of this is seen in the written portions of the examination, which the rules of the Department wisely require to be lodged with the Bureau. While it is far from being assumed that boards are infallible, a perusal of this work in most instances carries with it convincing vindication of the soundness of their judgment. The facilities for obtaining medical degrees are so great that the possession of a diploma is no longer, *per se*, an evidence of merit. Hence the duty devolves on the board to exercise great vigilance in scrutinizing the pretensions of those coming before it. Then, too, the emphatic words of the Department, announcing that "the health and lives of the officers and men of the Navy are objects too important to be intrusted to ignorant or incompetent persons," are a continual reminder to the board "not to report favorably upon any case admitting of a reasonable doubt." An obvious reason exists why assistant surgeons in the Navy should possess high qualifications, even higher than medical men practicing on shore. In difficult cases the latter has the privilege of consulting with older and more experienced practitioners, while the former is often left to depend on his own resources alone.

The experience of naval medical boards shows that, although a candidate may not always come up to the established standard, yet he may give such proofs of general aptitude that his failure is obviously more due to want of opportunity than of capacity. If this omission could in any way be supplied, a valuable and much needed acquisition might be secured to the Navy.

This leads me to speak of a want which is beginning to make itself seriously felt throughout the service, viz, of a school of instruction, under the control of the Department, for candidates of the description mentioned, as well as for assistant surgeons preparing for their second examination. The course of instruction would be for a limited period, and should be conducted under the guidance of medical officers of the Navy. The proper place for such a school would be at New York or Philadelphia, where there are large naval and civil hospitals, with museums and facilities for the study of practical anatomy.

England, with all her educational advantages, finds military service so peculiar in its demands on medical men, that at Netley she has laid the foundations of a school through which, hereafter, her army and navy surgeons must pass. A school on a much more moderate scale would suffice for the present wants of our service.

NAVAL LABORATORY.

During the past year the naval laboratory at New York, under its present excellent management, has furnished the Navy with a full stock of the best medicines. In this respect there is little left to be desired. The opportunity which the laboratory would afford of acquiring a practical knowledge of pharmacy, and, to a more limited extent, of chemistry, is an additional reason why the proposed school should be established in New York.

BUREAU PUBLICATIONS.

The publications of the Bureau during the year comprise two volumes of medical and surgical essays; and, though on a modest scale, these have been extensively sought after, and are believed to possess considerable

intrinsic value. In addition to these, the Bureau has in course of preparation a comprehensive medical and surgical work, which, when completed, will place within the reach of the profession an amount of valuable information now buried in journals and reports, which hitherto have never seen the light. When the manuscript is ready for the press, a small appropriation will be required to defray the expenses of publication. As the fruits of our enlarged experience during the war can thus be made available to the world at large, it is not doubted that the liberality which, in similar instances, has characterized the action of Congress, will sanction this new contribution to humanity and science.

Respectfully submitted.

J. BEALE,
Chief of Bureau.

A.—*Statement of sick, compiled from reports of sick from the naval stations in the United States, and from vessels in commission on home and foreign stations, for the year ending December* 31, 1872.

Hospitals.	Remaining sick December 31, 1871.	Admitted in 1872.	Discharged in 1872.	Died in 1872.	Total treated in 1872.	Remaining sick December 31, 1872.	Percentage of deaths to whole number of cases treated.
Chelsea, Mass	38	146	151	11	184	22	
Brooklyn, N. Y	52	220	193	11	272	68	
Philadelphia, Pa	32	257	230	16	289	43	
Annapolis, Md	6	21	21	.....	27	6	
Washington, D. C	16	114	109	5	130	16	
Norfolk, Va	10	128	98	8	138	32	
Pensacola, Fla	6	94	87	7	100	6	
Mare Island, Cal	52	131	137	2	183	44	
Yokohama, Japan	.... .	26	18	2	26	6	
	212	1,137	1,044	62	1,349	243	.004

Navy-yards and stations.	Remaining sick December 31, 1871.	Admitted in 1872.	Discharged in 1872.	Died in 1872.	Total treated in 1872.	Remaining sick December 31, 1872.	Percentage of deaths to whole number of cases treated.
Portsmouth, N. H	5	233	231	4	238	3	
Boston, Mass	7	242	242	1	249	6	
Brooklyn, N. Y	5	210	205	.....	215	10	
Philadelphia, Pa	7	227	228	2	234	4	
Washington, D. C	4	412	405	4	416	7	
Norfolk, Va	5	229	230	.....	234	4	
Pensacola, Fla	1	7	8	.....	8	.....	
Mound City, Ill	.....	24	23	.....	24	1	
Mare Island, Cal	9	98	102	1	107	4	
League Island, Pa	2	61	61	1	63	1	
Torpedo Station, Newport	.....	39	39	.....	39	.....	
Naval Academy	10	841	837	4	851	10	
	55	2,623	2,611	17	2,678	50	.006

Receiving ships.	Average number on board in 1872.	Remaining sick December 31, 1871.	Admitted in 1872.	Discharged in 1872.	Died in 1872.	Total treated in 1872.	Remaining sick December 31, 1872.	Percentage of deaths to whole number of cases treated.
Portsmouth N. H	121	1	79	79	.....	80	1	
Boston, Mass	216	9	218	223	1	227	3	
Brooklyn, N. Y	411	6	223	211	.....	229	18	
Philadelphia, Pa	147	4	99	96	1	103	6	
Norfolk, Va	115	.....	100	95	3	100	2	
Mare Island, Cal	125	.....	87	85	2	87	.....	
	1,135	20	806	789	7	826	30	.008

RECAPITULATION.

	Aggregate number of officers and men on board vessels in 1872.	Remaining sick December 31, 1871.	Admitted in 1872.	Discharged in 1872.	Died in 1872.	Total treated in 1872.	Remaining sick December 31, 1872.	Percentage of cases to number of persons on board.	Percentage of deaths to number of persons on board.	Percentage of deaths to number of persons treated.
Hospitals	.....	212	1,137	1,044	62	1,349	243	.....	.....	.046
Navy-yards and stations	.....	55	2,623	2,611	17	2,678	50	.....	.....	.006
Receiving-ships	1,135	20	806	789	7	826	30	.72	.006	.008
Vessels in commission at sea	11,570	229	8,978	8,891	61	9,207	255	.79	.005	.006
Total	12,705	516	13,544	13,335	147	14,060	578	1.01	.01	.01

Summary of vessels in commission.

Average number on board during the year 1872	11,570
Remaining sick December 31, 1871	229
Admitted in 1872	8,978
Discharged in 1872	8,891
Died in 1872	61
Total treated in 1872	9,207
Remaining sick December 31, 1872	255
Percentage of cases to whole number of persons on board	1.01
Percentage of deaths to whole number of persons on board	.01
Percentage of deaths to number of persons treated	.01

At the close of the year 1871 there remained under treatment 516 cases; during the year 1872 there occurred 13,544 cases of disease, injury, &c., making a total of 14,060 cases treated during the year; of which number 147 died, 13,335 were returned to duty or discharged the service, leaving 578 cases under treatment at the close of the year 1872.

The average strength of the Navy (officers, seamen, marines, engineer service, and coast survey included) for the year 1872, as near as can be ascertained, was about 12,705.

The proportion of cases admitted to the whole number of persons in the service was about 1.01, or each person was on the sick-list $1\frac{1}{100}$ times during the year. The percentage of deaths to the whole number in the service was .01, and the percentage of deaths to the whole number of cases was .01.

The total number of deaths from all causes reported at the Navy Department from October 1, 1872, to September 30, 1873, was 330.

B.—*Summary of prevalent forms of disease on home and foreign service for the year ending December* 31, 1872.

	North Atlantic.	South Atlantic.	European.	Pacific.	Asiatic.	Special service.	School and practice.	Coast survey.	Total.
Aggregate number of men	2,211	1,054	2,252	2 544	2,600	608	202	99	11,57
Febrile diseases:									
Cases treated	496	75	127	258	174	49	6	10	1,195
Deaths	3	.....	5	3	1	.....	.....	.....	12
Diseases of the digestive system:									
Cases treated	250	217	208	273	355	78	28	63	1,472
Deaths	.....	.....	2	.....	7	.....	.....	.....	9
Diseases of the respiratory system:									
Cases treated	152	116	233	230	152	83	24	30	1,020
Deaths	11	3	1	.....	2	1	.....	.....	18
Diseases of the circulatory system:									
Cases treated	28	9	33	44	42	2	1	6	165
Deaths	1	.....	2	2	1	.....	.....	.....	6
Diseases of the brain and nervous system:									
Cases treated	83	39	64	128	88	16	9	13	440
Deaths	1	1	.....	2	.....	.....	.....	.....	4
Diseases of the cutaneous and cellular system:									
Cases treated	162	100	193	337	231	40	9	20	1,092
Deaths	1	.....	.....	.....	.....	.....	.....	.....	1
Diseases of the fibrous, osseous, and muscular system:									
Cases treated	183	59	164	176	170	42	12	14	820
Deaths	.....	.....	2	.....	1	.....	.....	.....	3
Diseases of the serous and absorbent system:									
Cases treated	2	1	13	.....	.....	.....	.....	.....	16
Deaths	1	.....	.....	.....	.....	.....	.....	.....	1
Diseases of the genito-urinary system:									
Cases treated	86	89	214	296	349	35	16	27	1,112
Deaths	.....	.....	.....	.....	.....	.....	.....	.....	.....
Malignant diseases:									
Cases treated	35	7	9	25	29	3	1	.....	109
Deaths	1	.....	.....	.....	.....	.....	.....	.....	1
Diseases of the eye and ear:									
Cases treated	27	20	37	41	34	9	.....	3	171
Deaths	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wounds and injuries:									
Cases treated	288	223	308	382	232	109	37	16	1,595
Deaths	.....	.....	3	3	.....	.....	.....	.....	6
Total cases treated	1,792	955	1,603	2,190	1,856	466	143	202	9,207
Total deaths	19	4	15	10	12	1	.....	.....	61

C.—*Naval-hospital fund.*

The condition of this fund is represented as follows:

Balance on hand October 1, 1872	$73,910 04
Transferred to the fund by the Fourth Auditor, in settlement of accounts, &c., from October 1, 1872, to October 1, 1873	72,954 43
Transferred to the fund on account of supplies from the naval laboratory to vessels and navy-yards, from October 1, 1872, to October 1, 1873	7,585 10
Total	154,449 57
Deduct amount expended from October 1, 1872, to October 1, 1873	135,786 22
Balance on hand October 1, 1873	18,663 35

D.—*Insane of the Navy.*

On the 30th September, 1873, there remained under treatment in the Government Hospital for the Insane, near this city, 3 officers, 1 late ensign, 7 marines, 10 seamen, 4 landsmen, 1 coal-heaver, 1 late first-class boy, (white,) 1 late first-class boy, (colored,) 3 beneficiaries, and 1 late seaman—total 32
Admitted during the year ending September 30, 1873: 4 landsmen, 5 marines, 1 ordinary seaman, 1 ordinary seaman ex, 1 late ordinary seaman—total 12

Total number under treatment during the year 44
The discharges in the course of the year were: 6 landsmen, 2 marines, 1 seaman, 1 late first-class boy, (white,) 1 ordinary seaman, 1 beneficiary—total 12

Leaving in the institution on the 30th September, 1873: 3 officers, 1 late ensign, 9 seamen, 1 ordinary seaman ex, 2 landsmen, 10 marines, 1 coal-heaver, 1 late first-class boy, (colored,) 2 beneficiaries, 1 late seaman, 1 late ordinary seaman—total 32

Estimates of appropriations required for the service of the fiscal year ending June 30, 1875, by the Bureau of Medicine and Surgery.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1874.
SALARIES.		
One clerk of class four, per act of July 23, 1866, (14 Stat. at L., p. 208, sec. 8)	$1,800 00	.....
One clerk of class three, per act of July 23, 1866, (14 Stat. at L., p. 208, sec. 8)	1,600 00	.....
One messenger, per acts of July 5, 1862, (12 Stat. at L., p. 511, sec. 3,) and July 12, 1870, (16 Stat. at L., p. 250, sec. 3)	840 00	.....
One laborer, per act of July 12, 1870, (16 Stat. at L., p. 493, sec. 1)	720 00	.....
	4,960 00	$4,960 00
CONTINGENT EXPENSES.		
Stationery and miscellaneous items; (appropriated, 17 Stat. at L., p.502, sec. 1)	600 00	400 00
REPAIRS AND IMPROVEMENTS OF HOSPITALS.		
Repairs to naval laboratory, naval hospitals and appendages, including roads, wharves, outhouses, sidewalks, fences, gardens, farms, cemeteries, steam-heating apparatus, furniture, head-marks for graves in cemeteries, &c.; (appropriated, 17 Stat. at L., p. 551, sec. 1)	50,200 00	25,000 00
SURGEONS' NECESSARIES AND APPLIANCES.		
Support of the medical department of vessels in commission, navy-yards, naval stations, Marine Corps, and Coast Survey; (appropriated, 17 Stat. at L., p. 551, sec. 1)	40,000 00	40,000 00
CIVIL ESTABLISHMENT.		
At the hospital, Chelsea, Mass.:		
1 purveyor, at $750; 1 apothecary, at $480; 1 chief cook, at $240; (appropriated, 17 Stat. at L., p. 551, sec. 11)	$1,470 00	
1 second cook, at $168; 3 bay-men, at $240 each; 3 washers, at $160 each; (appropriated, 17 Stat. at L., p. 551, sec. 1.)	1,392 00	
4 watchmen, at $360 each; 2 laborers, at $240 each; 1 engineer, at $600; (appropriated, 17 Stat. at L., p. 551, sec. 1)	2,520 00	
2 firemen, at $360 each; 1 gardener, at $300; 1 farmer, at $480; (appropriated, 17 Stat. at L., p. 551, sec. 1)	1,500 00	
1 messenger, at $240; 1 gate-keeper, at $300; 1 matron, at $360; (appropriated, 17 Stat. at L., p. 551, sec. 1)	900 00	
	7,782 00	7,782 00

Estimates of appropriations, &c.—Continued.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.		Amount appropriated for the current fiscal year ending June 30, 1874.
At the hospital, New York:			
1 purveyor, at $750; 1 apothecary, at $750; 1 carpenter, at $720; (appropriated, 17 Stat. at L., p. 551, sec. 1)	$2,220 00		
1 chief cook, at $300; 2 cooks, at $180 each; 4 bay-men, at $240 each; (appropriated, 17 Stat. at L., p. 551, sec. 1)	1,620 00		
2 washers and 2 chambermaids, at $168 each; 1 master-at-arms, (policeman,) at $420; (appropriated, 17 Stat. at L., p. 551, sec. 1)	1,092 00		
2 watchmen, at $300 each; 3 laborers, at $240 each; 2 mess-men, 1 at $240 and 1 at $216; (appropriated, 17 Stat. at L., 551, sec. 1)	1,776 00		
1 engineer, at $720; 3 firemen, at $360 each; 1 painter and glazier, and 1 gardener, at $480 each; (appropriated, 17 Stat, at L., p. 551, sec. 1)	2,760 00		
1 ambulance-driver and 1 messenger, at $420 each; 1 matron, at $420; (appropriated, 17 Stat. at L., p. 551, sec. 1)	1,260 00		
2 gate-keepers, 1 at main gate, at $360, and 1 at rear gate, at $240; (appropriated, 17 Stat. at L., p. 551, sec. 1)	600 00		
		$11,328 00	$11,332 00
At the hospital, Philadelphia, Pa.:			
1 purveyor, at $750; 1 apothecary, at $480; 1 carpenter, at $480; 1 chief cook, at $240; (apppropriated, 17 Stat. at L., p. 551, sec. 1).	1,950 00		
1 cook, at $168; 3 bay-men, at $240 each; 3 washers and 1 scrubber, at $168 each; (appropriated, 17 Stat. at L., p. 551, sec. 1)	1,560 00		
1 master-at-arms, at $420; 2 laborers, at $240 each; 1 mess-room attendant, at $240; (appropriated, 17 Stat. at L., p. 551, sec. 1)	1,140 00		
1 engine-tender, at $600; 2 firemen, at $360 each; 1 gardener, at $300; (appropriated, 17 Stat. at L., p. 551, sec. 1)	1,620 00		
1 ambulance-driver, at $240; 1 messenger, at $240; 1 matron, at $240; (appropriated, 17 Stat. at L., p. 551, sec. 1)	720 00		
		6,990 00	6,990 00
At the hospital, Annapolis, Md.:			
1 purveyor, at $750; 1 chief cook, at $210; 1 cook, at $168; (appropriated, 17 Stat. at L., p. 551. sec. 1)	1,128 00		
2 bay-men and 1 laborer, at $168 each; 1 watchman, at $360; 1 washer, at $180; (appropriated, 17 Stat. at L., p. 551, sec. 1)	944 00		
1 engine-tender, at $600; 2 firemen, at $360 each; 1 gardener, at $300; (appropriated, 17 Stat. at L., p. 551, sec. 1)	1,620 00		
1 ambulance-driver, 1 messenger, and 1 matron, at $240 each; (appropriated, 17 Stat. at L., p. 551, sec. 1)	720 00		
		4,512 00	4,512 00
At the hospital, Washington, D. C.:			
1 purveyor, at $750; 1 apothecary, at $480; 1 chief cook, at $240; 2 cooks, at $168 each; (appropriated, 17 Stat. at L., p.551, sec. 1).	1,806 00		
3 bay-men, at $240 each; 3 washers and 2 laborers, at $144 each; 1 watchman, at $420; (appropriated, 17 Stat. at L., p.551, sec. 1).	1,860 00		
2 firemen, 1 at $420 and 1 at $360; 1 ambulance-driver, at $300; 1 messenger, at $180; (appropriated, 17 Stat. at L., p. 551, sec. 1)	1,260 00		
		4,926 00	4,926 00
At the hospital, Norfolk, Va.:			
1 purveyor, at $750; 1 apothecary, at $480; 1 chief cook, at $300; 1 cook, at $240; (appropriated, 17 Stat. at L., p. 552, sec. 1)	1,770 00		
4 bay-men, 1 at $240, and 3 at $168 each; 1 watchman, at $300; 3 laborers, at $192 each; (appropriated, 17 Stat. at L., p.552, sec. 1).	1,620 00		
2 washers, at $144 each; 1 engineer, at $720; 2 mess-room attendants, at $168 each; (appropriated, 17 Stat. at L., p. 552, sec. 1)	1,344 00		
4 boatmen, at $168 each; (appropriated, 17 Stat. at L, p.552, sec. 1).	672 00		
		5,406 00	5,406 00
At the hospital, Pensacola, Fla.:			
1 purveyor, at $750: 1 apothecary, at $480; 1 chief cook, at $240; 1 cook, at $216; (appropriated, 17 Stat. at L., p. 552, sec. 1)	1,686 00		
4 bay-men, at $264 each; 4 bay-men, at $216 each; 1 watchman, at $216; (appropriated, 17 Stat. at L., p. 552, sec. 1)	2,136 00		
3 laborers and 1 messenger, at $144 each; 2 washers, at $180 each; (appropriated, 17 Stat. at L., p. 552, sec. 1)	936 00		
2 mess-room attendants, at $168 each; (appropriated, 17 Stat. at L., p. 552, sec. 1)	336 00		
		5,094 00	5,094 00
At the hospital, Mare Island, Cal.:			
1 purveyor, at $1,000; 1 chief cook, at $540; 1 cook, at $480; (17 Stat. at L., p. 552, sec. 1)	2,020 00		
4 bay-men and 4 washers, at $480 each; 1 watchman and 2 laborers, at $360 each; (appropriated, 17 Stat. at L., p. 552, sec. 1)	49 20		
mess-room attendants, at $216 each; 1 engineer, at $1,000; 1 fireman, at $500; (appropriated, 17 Stat. at L., p. 552, sec. 1)	1,932 00		
		8,872 00	8,872 00

Estimates of appropriations, &c.—Continued.

Detailed objects of expenditure and explanations.		Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1874.
At the hospital, Yokohama, Japan:			
1 apothecary, at $750; 1 chief cook, at $360; 1 cook, at $144; 2 bay-men, at $216 each; (appropriated, 17 Stat. at L., p. 552, sec. 1)	$1,686 00		
1 watchman, at $240; 1 gardener, at $120; 1 messenger, at $192; 4 laborers, at $60 each; (appropriated, 17 Stat. at L., p. 552, sec. 1)	792 00		
		$2,478 00	$2,478 00
At the naval laboratory, New York:			
1 manufacturer, 1 clerk, and 1 carpenter, at $800 each; 1 engineer, at $800; (appropriated, 17 Stat. at L., p. 552, sec. 1)	3,200 00		
1 chief packer, at $800; 1 shipping porter, at $500; 1 fireman and 1 porter, at $350 each; (appropriated, 17 Stat. at L., p. 552, sec. 1)	2,000 00		
1 assistant manufacturer and 3 assistant packers, at $300 each; (appropriated, 17 Stat. at L., p. 552, sec. 1)	1,200 00		
		6,400 00	6,400 00
At the navy-yard, Portsmouth, N. H.:			
1 apothecary, at $750; 1 nurse, at $180; 1 laborer and 1 cook, at $180 each; (appropriated, 17 Stat. at L., p. 552, sec. 1)		1,290 00	1,290 00
At the navy-yard, Boston, Mass.:			
1 apothecary, at $750; 1 laborer, at $2 per day, $730; (appropriated, 17 Stat. at L., p. 552, sec. 1)		1,480 00	1,480 00
At the navy-yard, New York:			
1 apothecary, at $750; 1 laborer, at $2 per day, $730; (appropriated, 17 Stat. at L., p. 552, sec. 1)		1,480 00	1,480 00
At the navy-yard, Philadelphia, Pa.:			
1 apothecary, at $750; 1 laborer, at $2 per day, $730; (appropriated, 17 Stat. at L., p. 552, sec. 1)		1,480 00	1,480 00
At the navy-yard, Washington, D. C.:			
1 apothecary, at $750; 1 laborer, at $2 per day, $730; (appropriated, 17 Stat. at L., p. 552, sec. 1)		1,480 00	1,480 00
At the navy-yard, Norfolk, Va.:			
1 apothecary, at $750; 1 laborer, at $2 per day, $730; (appropriated, 17 Stat. at L., p. 552, sec. 1)		1,480 00	1,480 00
At the Naval Academy, Annapolis, Md.:			
1 apothecary, $750; 1 nurse, $180; 1 cook, $168; 1 laborer, $144; (appropriated, 17 Stat. at L., p. 552, sec. 1)		1,242 00	1,242 00
At the naval station, Mound City, Ill.:			
1 apothecary, at $750; 1 laborer, at $2 per day, $730; (appropriated, 17 Stat. at L., p. 552, sec. 1)		1,480 00	1,480 00
		75,200 00	75,204 00
CONTINGENT.			
For contingent expenses of the Bureau; for freight on medical stores; transportation of insane patients; advertising; telegraphing; purchase of books; expenses attending naval medical examining boards; purchase and repair of wagons and harness; purchase of cows and horses, and feed for same; purchase of trees, seeds, garden tools, and fuel; subscription to necessary periodicals, &c.; (appropriated, 17 Stat. at L., p. 552, sec. 1)		25,000 00	25,000 00
RECAPITULATION.			
Salaries, &c		$5,560 00	$5,360 00
Repairs and improvements of hospitals		50,200 00	25,000 00
Surgeons' necessaries and appliances		40,000 00	40,000 00
Civil establishment		75,200 00	75,204 00
Contingent		25,000 00	25,000 00
		195,960 00	170,564 00

J. BEALE,
Surgeon-General United States Navy.

No. 8.

BUREAU OF PROVISIONS AND CLOTHING.

BUREAU OF PROVISIONS AND CLOTHING,
November 3, 1873.

SIR: I have the honor to submit herewith estimates marked A, B, C, D, and E, and schedules marked F, G, H, I, and K, for the fiscal year ending June 30, 1875.

I am, very respectfully, your obedient servant,

JAS. H. WATMOUGH,
Acting Paymaster-General, U. S. N.

Hon. GEO. M. ROBESON,
Secretary of the Navy.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1875, *by the Bureau of Provisions and Clothing.*

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1874.
A.—EXPENSES OF THE BUREAU OF PROVISIONS AND CLOTHING.		
For salary of chief clerk, per act of July 5 1862, (12 Stat. at L., p. 511, sec. 3)	$1,800 00	.....
For salary of one clerk of class four, per act of July 23, 1866, (14 Stat. at L., p. 208, sec. 8)	1,800 00	.....
For salary of three clerks of class three, per act of July 23, 1866, (14 Stat. at L., p. 208, sec. 8)	*4,800 00	.....
For salary of two clerks of class two, per act of July 23, 1866, (14 Stat. at L., p. 208, sec. 8)	2,800 00	.....
For salary of three clerks of class one, per act of July 23, 1866, (14 Stat. at L., p. 208, sec. 8)	3,600 00	.....
For salary of messenger, per act of July 5, 1862, (12 Stat. at L., p. 511, sec. 3)	840 00	.....
For salary of one laborer, per act of July 12, 1870, (16 Stat. at L., p. 250, sec. 3)	720 00	.....
	16,360 00	$14,760 00
B.—CONTINGENT EXPENSES OF THE BUREAU.		
For blank-books, stationery, and miscellaneous items; (appropriated, Stat. at L., pamphlet edition, p. 502, sec. 1)	800 00	800 00
C.—PROVISIONS FOR THE NAVY.		
For provisions for the officers, seamen, and marines; viz., 8,500 men, 900 commissioned officers, and 1,200 marine officers and privates; (appropriated, Stat. at L., pamphlet edition, p. 552, sec. 1)	1,547,600 00	.....
For the purchase of water for ships; (appropriated, Stat. at L., pamphlet edition, p. 552, sec. 1)	40,000 00	.....
	1,587,600 00	1,587,600 00
D.—CIVIL ESTABLISHMENT, BUREAU OF PROVISIONS AND CLOTHING, AT THE SEVERAL NAVY-YARDS.		
At navy-yard, Boston, one writer to paymaster; (appropriated, Stat. at L., pamphlet edition, p. 552, sec. 1)	1,017 25	.....
At navy-yard, Boston, one writer to inspector of provisions and clothing, (appropriated, Stat. at L., pamphlet edition, p. 552, sec. 1)	1,017 25	.....
At navy-yard, New York, one writer to inspector, (in lieu of an assistant in-		

* The estimate for an additional clerk of class three (allowed by act of July 23, 1866, but not heretofore required) is submitted on account of the Department's order of July 21, 1873, requiring the accounts of all pay officers to be settled quarterly instead of at the end of a cruise.

Estimates of appropriations, &c.—Continued.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1874.
spector, at $1,878;) appropriated, Stat. at L., pamphlet edition, p. 552, sec. 1)	$1,252 00	.....
At navy-yard, New York, one writer to inspector, (appropriated, Stat. at L., pamphlet edition, p. 552, sec. 1)	1,017 25	.....
At navy-yard, New York, two writers to paymaster, at $1,017.25; (appropriated, Stat. at L., pamphlet edition, p. 552, sec. 1)	2,034 50	.....
At navy-yard, New York, assistant superintendent of mills, (appropriated, Stat. at L., pamphlet edition, p. 552, sec. 1)	1,095 50	.....
At navy-yard, Philadelphia, one writer to paymaster, (appropriated, Stat. at L., pamphlet edition, p. 552, sec.1)	1,017 25	.....
At navy-yard, Philadelphia, one writer to inspector, (appropriated, Stat. at L., pamphlet edition, p. 552, sec. 1)	1,017 25	.....
At navy-yard, Washington, one writer to paymaster, (appropriated, Stat. at L., pamphlet edition, p. 552, sec. 1)	1,017 25	.....
At navy-yard, Norfolk, one writer to paymaster, (appropriated, Stat. at L., pamphlet edition, p. 552, sec. 1)	1,017 25	.....
At navy-yard, Mare Island, one writer to paymaster, (appropriated, Stat. at L., pamphlet edition, p. 552, sec. 1)	1,017 25	.....
At navy-yard, Mare Island, one writer to inspector, (appropriated, Stat. at L., pamphlet edition, p. 552, sec. 1)	1,295 50	.....
	13,815 50	$14,285 00
E.—CONTINGENT EXPENSES OF THE NAVY UNDER BUREAU OF PROVISIONS AND CLOTHING.		
For freight and transportation to foreign and home stations; for candles; for fuel; for interior alterations and fixtures in inspection buildings; for tools, and repairing same at eight inspections; for special watchmen in eight inspections; for books and blanks; for stationery; for telegrams, postages, and express charges; for tolls, ferriages, and car-tickets; for ice; and for incidental labor not chargeable to other appropriations; (appropriated, Stat. at L., pamphlet edition, p. 553, sec. 1)	75,000 00	75,000 00

F.—*Schedule of proposals for clothing and clothing-materials received under advertisement dated October 19, 1872.*

Name.	Residence.	6,000 pairs blue cloth trowsers.	Blue flannel.		5,000 pairs calf shoes.	5,000 pairs kip shoes.	Mattresses, with two covers each.			15,000 yards linen sheeting.
			40,000 yards for New York.	15,000 yards for Mare Island.			3,000 for New York.	1,000 for Philadelphia.	1,000 for Boston.	
		Per pair	*Per yard.*	*Per yard.*	*Per pair*	*Per pair*	*Each.*	*Each.*	*Each.*	
Clark Woolen Company	New York, N. Y	.....	$0 72½	$0 82½	.....	.....	.....	.....	.....	.....
William McKnight	Philadelphia, Pa	.....	.....	.....	*$2 55	*$2 29	.....	.....	.....	.....
J. H. Howard	New York, N. Y	.....	75	.....	.....	.....	$6 73	$6 73	$6 73	.....
David Lamb & Co	do	.....	.....	.....	.....	.....	.....	.....	.....	$0 89 2-5
J. W. McKnight	Washington, D. C	.....	.....	.....	.....	.....	6 95	6 95	6 95	.....
David C. Mayne	Camden, N. J	.....	.....	.....	2 69	2 36	.....	.....	.....	.....
Isaac C. Noe	New York, N. Y	$6 86	.....	.....	.....	.....	8 50	8 50	8 50	.....
Noblit, Brown, Noblit & Co	Philadelphia, Pa	.....	.....	.....	.....	.....	7 60	7 60	7 60	.....
John G. Flagg †	Boston, Mass	.....	.....	.....	.....	.....	6 22	6 22	6 22	.....
J. Symington	New York, N. Y	.....	.....	.....	.....	.....	.....	.....	.....	98 86-100
John H. Wilcox	do	.....	.....	.....	.....	.....	7 34	7 38	7 36	1 14¼
C. L. Fowle †	Boston, Mass	.....	.....	.....	.....	.....	*6 57	*6 57	*6 57	.....
H. T. Champney	do	.....	.....	.....	.....	.....	6 90	6 90	6 90	.....
Cooper & Hall	Philadelphia, Pa	.....	.....	.....	.....	.....	7 50	7 50	7 30	.....
J. Freeman & Co	Orange, N. J	.....	.....	.....	2 59	2 49	.....	.....	.....	.....
John Thompson	Philadelphia, Pa	.....	.....	.....	.....	.....	7 35	7 35	7 35	.....
S. C. Carll	do	.....	.....	.....	.....	.....	6 93	6 93	6 93	.....
John Mundell	do	.....	.....	.....	2 68	2 35	.....	.....	.....	.....
A. L. Haskell & Son	Boston, Mass	.....	88½	.....	.....	.....	6 73	6 73	6 73	.....
Mission and Pacific Woolen Mills	San Francisco, Cal	*6 12½	*56½	*56½	.....	.....	.....	.....	.....	.....
William Mathews	New York, N. Y	6 57	73 1-5	85	.....	.....	.....	.....	.....	*82 7-10
Lindenburger & Burke	San Francisco, Cal	.....	.....	59 99-100	.....	.....	.....	.....	.....	.....

*Contract awarded.

† J. G. Flagg and C. L. Fowle declining to make contract, it was awarded to A. L. Haskell & Son, at $6.57.

G.—*Schedule of proposals for blankets received under advertisement dated April 2, 1873.*

Name.	Residence.	4,000 pairs for New York.	1,000 pairs for Mare Island.
		Per pair.	*Per pair.*
William Mathews	New York	$5 97	$5 97
W. M. Betts	do	6 73	6 73
John Dobson*	Philadelphia	5 85	6 18
Lindenburger & Burke	San Francisco	.....	6 75
Donald McLennan	do	7 62	7 62

* Contract awarded.

H.—*Schedule of proposals for pickles received under advertisement dated August 10, 1872.*

Name.	Residence.	175,000 pounds for New York.	25,000 pounds for Boston.
		Per pound.	*Per pound.*
Skilton, Foote & Co	Boston	$0.0950	$0.0925
William Mathews	New York	.1030	.1030
J. A. Oakes & Co*	do	.0875	.0875
W. K. Lewis & Bros	Boston	.0894	.0894

* Contract awarded.

I.—*Schedule of proposals for fresh beef and vegetables received during the fiscal year ending June 30, 1873.*

Name.	Date of advertisement.	Where to be delivered.	Beef.	Vegetables.
			Per pound.	*Per pound.*
Hobbs & Wilson*	July 6, 1872	Boston, Mass	$0.07	$0.00375
Cyrus Flanders	July 6, 1872	do	.0625	.015
George H. Spaulding	July 6, 1872	do	.0725	.01
Mosser & Co	Dec. 2, 1872	New York, N. Y	.087	.02
William H. Kimberly	Dec. 2, 1872	do	.1098	.0225
J. W. Irving	Dec. 2, 1872	do	.07	.04
Peter Dempsey	Dec. 2, 1872	do	.135	.025
Patrick Morrison	Dec. 2, 1872	do	.097	.02
J. J. Lyons	Dec. 2, 1872	do	.082	.0125
John Hanley*	Dec. 2, 1872	do	.0721	.0119
Patrick Morrison	June 14, 1873	do	.155	.0475
Moses Strauss	June 14, 1873	do	.1545	.045
George Buddle	June 14, 1873	do	.145	.054
William McArdle	June 14, 1873	do	.145	.045
John Hanley*	June 14, 1873	do	.13875	.03875
L. S. Boraef*	June 14, 1873	Philadelphia, Pa	.15625	.0575
W. P. Corney	June 14, 1873	do	.16	.065
Cyrus Flanders	June 16, 1873	Boston, Mass	.08	.015
J. W. Hobbs*	June 16, 1873	do	.065	.0075
Kimberly Bros*	June 16, 1873	Norfolk, Va	.15	.05125
Nathan Baum	June 16, 1873	do	.15125	.05125
A. H. Lindsay	June 16, 1873	do	.15375	.05375
Summy & Holmead	June 17, 1873	Washington, D. C	.10	.035
S. Gammage	June 17, 1873	do	.125	.06
J. T. Varnell*	June 17, 1873	do	.0549	.03
J. G. Carroll	June 17, 1873	do	.10	.029
William Turner	June 17, 1873	do	.10	.035
M. H. Homiller	June 17, 1873	do	.075	.0275
G. N. Beale	June 17, 1873	do	.0999	.03375
James Murphy*	June 18, 1873	Pensacola, Fla	.10	.04
J. S. Bell	June 18, 1873	do	.10	.05
Wagner & Leikauf	June 18, 1873	do	.10	.06
James F. Tobin*	June 21, 1873	San Francisco, Cal	.06	.0175
Felix Uri	June 21, 1873	do	.0675	.035
A. Newman†	June 21, 1873	do	.057	.014
J. B. Dow	June 21, 1873	do	.083	.0271
John Muller	June 21, 1873	do	.075	.05
Brackett & Keyes	June 21, 1873	do	.09	.03
John Stokell & Co*	June 23, 1873	Portsmouth, N. H	.10	.02

* Contract awarded.

† Declined to make contract.

K.—*Statement of contracts made by the Bureau of Provisions and Clothing for and in behalf of the Navy Department, during the fiscal year ending June* 30, 1873.

Name.	Date.	Articles contracted for.	Price.	Where to be delivered.
	1872.			
J. F. Tobin	July 1	130,000 pounds fresh beef.... per pound	$0.075	Mare Island, Cal.
Do	July 1	125,000 pounds fresh vegetables....do...	.015	Do.
John Stokell & Co...	July 3	20,000 pounds fresh beef .....do...	.12	Portsmouth, N.H.
Do	July 3	20,000 pounds fresh vegetables....do...	.02	Do.
Hobbs & Wilson	July 22	75,000 pounds fresh beef .....do...	.07	Boston, Mass.
Do	July 22	75,000 pounds fresh vegetables....do...	.00375	Do.
J. A. Oakes & Co	Sept. 9	200,000 pounds pickles.....do...	.0875	New York and Boston.
Wm. McKnight	Nov. 29	2,000 pairs calf shoes.....per pair	2.55	New York.
Do	Nov. 29	1,500 prs. cable-screwed calf shoes do...	2.29	Do.
Do	Nov. 29	4,000 prs. cable-screwed kip shoes do...	2.29	Do.
Wm. Mathews	Nov. 29	15,000 yds. Barnsley sheeting..per yard	.827	Do.
John Mundell & Co..	Dec. 9	1,000 prs. brass-screwed calf shoes, per pair.	2.55	Philadelphia, Pa.
Do	Dec. 9	1,000 prs. brass screwed kip shoes, per pair.	2.29	Do.
John Hanley	Dec. 19	100,000 pounds fresh beef.....per pound	.0721	New York.
Do	Dec. 19	100,000 pounds fresh vegetables....do...	.0119	Do.
Mission and Pacific Woolen Mills Co.	Dec. 28	40,000 yards blue flannel.....per yard	.565	Do.
Do	Dec. 28	6,000 prs. blue-cloth trowsers, per pair	6.125	Do.
Do	Dec. 28	15,000 yards blue flannel.....per yard	.565	Mare Island, Cal.
	1873.			
A. L. Haskell & Son..	Jan. 4	5,000 mattresses, with 2 covers each, at	6.57	New York, Philadelphia, & Boston.
Porous Water-Proofing Co.	Mar. 29	10,000 pairs water-proofed calf shoes, per pair.	3.05	Do.
John Dobson	May 20	4,000 pairs blankets.....per pair	5.85	New York.
Do	May 20	1,000 pairs blankets.....do...	6.18	Mare Island, Cal.
John Hanley	June 28	100,000 pounds fresh beef....per pound	.13875	New York.
Do	June 28	100,000 pounds fresh vegetables....do...	.03875	Do.

No. 9.

BUREAU OF STEAM ENGINEERING.

NAVY DEPARTMENT,
Bureau of Steam Engineering, Washington, 1873.

SIR: In obedience to your order of ———, I have the honor respectfully to submit the annual report of this Bureau, with estimates for the several navy-yards; for repairs to the machinery of vessels of the Navy afloat; for the repair, preservation, and refitting of such as are required for service at sea; for stores and materials; and for the civil establishment in this Bureau and the navy-yards.

MACHINERY REPAIRED, UNDER REPAIR, AND TO BE REPAIRED.

During the year past the machinery of the following named vessels has been repaired and refitted for active service: Monongahela, (2d rate,) at the Kittery Navy-yard; Juinata, (3d rate,) at the Charlestown Navy-yard; Alaska, (2d rate,) Ossipee, (3d rate,) Kansas, (3d rate,) and Tigress, at the Brooklyn Navy-yard; Canandaigua, (2d rate,) Pilgrim, (tug,) and Pinta, (tug,) at the Philadelphia Navy-yard; Gettysburg, (4th rate,) and Fortune, (tug,) at the Washington Navy-yard; Mahopac (iron clad,) Jean Sands, (tug,) and Standish, (tug,) at the Norfolk Navy-yard; Saranac, (2d rate,) Benicia, (2d rate,) and Kearsarge, (3d rate,) at the Mare Island Navy-yard; and the Manhattan, (iron clad,) under contract with William Cramp & Sons, Philadelphia.

The Ashuelot, (3d rate,) Monocacy, (3d rate,) Saco, (3d rate,) and Palos, (4th rate,) having been retained on the Asiatic station, extensive

repairs were required upon their boilers; which have been executed in the machine shops of private establishments principally at Shanghai, China, and at the Government dock-yard at Yokoska, Japan. Extensive repairs are now required to the boilers of the Iroquois, (3d rate.)

The machinery of the Tennessee, (2d rate,) at New York, under contract with John Roach, is very nearly completed, being now ready for trial under steam.

The machinery of the following-named vessels is under repair: Plymouth, (2d rate,) Speedwell, (tug,) and Blue Light, (tug,) at Kittery; Franklin, (1st rate,) and Brooklyn, (2d rate,) at Charlestown, and Shawmut, (3d rate,) at Washington; Canonicus, (iron clad,) under contract with "The Harlan & Hollingsworth Company," Wilmington, Del.; and the Nahant and Wyandotte (iron-clads,) under contract with the "Delaware River Iron Works," while entirely new machinery of the compound type is being constructed for the Nipsic, (3d rate,) under contract with William Wright & Co., Newburgh, N. Y. The machinery of the following-named vessels is to have extensive repairs, and new boilers are to be put on board; Congress, (2d rate,) Lancaster, (2d rate,) Pensacola, (2d rate,) Nyack, (3d rate,) Wyoming, (3d rate,) and Tallapoosa, (4th rate). The hull of the Nevada, (2d rate,) having been condemned the machinery has been removed and advertised for sale.

MACHINERY PARTIALLY COMPLETED AND COMPOUND ENGINES.

With reference to the disposition of the machinery on hand stored in the several navy-yards, and that partially completed, (50 inches by 42 inches engines, Quinnebaug class,) the board of engineer officers appointed by the Department, under date of February 8 and May 3 of last year, have submitted their report. This report contains, in addition to conclusions and suggestions as to the disposition of the above machinery, the results of thorough investigations of the theory and practice of the compound engine. The tables are formed upon data believed to be absolutely reliable.

The following is their report:

WASHINGTON, D. C., *December* 16, 1872.

SIR: Relative to certain marine engines now stored in the navy-yards at Portsmouth, Boston, New York, Philadelphia, and Washington, examined by us under orders of the Navy Department, dated February 8, 1872, we beg leave to submit the following statement:

Among them are four sets of direct-acting engines for twin screw-vessels, each set comprising two pairs, with cylinders of 46½ inches diameter, designed for iron-clad vessels of the Kalamazoo class; and two pairs of geared engines of 100 inches diameter of cylinder, designed for screw-vessels of the Florida class. Of the former class none have ever been put in service. Of the latter class two pairs have been operated successfully at sea.

None of the engines above specified can be advantageously converted to the compound type. Those of the Kalamazoo class can be made to render efficient service in the propulsion of iron-clad vessels suitable for coast and harbor defense. Those of the Florida class can be used for the same purpose or for the propulsion of iron vessels of dimensions and form similar to those of the wooden vessels for which they were constructed, in which carrying qualities were subordinated to the one of great speed. None of these engines are adapted to the requirements of any of the vessels now in course of preparation by the Department; and the ycan only be disposed of either by preserving them for use in case of emergency, or by sale. In the latter case it is probable that the proceeds would not exceed the value of the material, considered as old metal.

Should any sudden emergency arise requiring the speedy construction of engines for use in harbor and coast defense, it would be found that facilities for meeting the demand do not exist in the country. The Department might be able to obtain machinery of a better type, but it would be only after a delay that might render the superiority of no avail. And the superiority would consist chiefly in a reduced cost of main-

tenance; doubtful, perhaps, and of but small importance at the best. Having regard, therefore, rather to the possible future needs of the Department than to the intrinsic merits or faults of the machinery above specified, we would recommend that it be preserved in the navy-yards until such time as the Department shall be supplied with better engines.

Besides the engines already mentioned there are stored in the navy-yards one pair of marine engines of 36 inches diameter of cylinder and 36 inches stroke of piston, known as the Swatara class; four pairs of 50 inches diameter of cylinder and 42 inches stroke of piston, known as the Benicia class; and twelve pairs of 60 inches diameter of cylinder and 36 inches stroke of piston, known as the Guerriere class. Most of the boilers constructed for them have been used to replace others of similar kinds worn out in service on board naval vessels. These engines are all of excellent design, and may be easily converted to the type known as compound-engines. With the exception of six pairs of the Guerriere class, all of them are yet in an incomplete condition.

Several vessels now in service are fitted with machinery precisely similar, and its performance has always been excellent. The engines are simple, durable, substantial in construction, and convenient of management. In these respects they are certainly not inferior to any marine engines now in use on board naval vessels, whether of the compound or any other type. They are designed to work steam of a boiler-pressure of 40 pounds to the square inch, and their valve-gear is arranged so as to admit of the use of the steam expansively at measures ranging from $1\frac{1}{2}$ to $2\frac{1}{2}$ times the initial volume. They are quite as economical in fuel as any other non-compound marine engines now in use. Examples of their economical performance are given in the tables appended to this report. In Table I, the cost of the power developed by them severally is collated with that of a large number of non-compound engines varying in design. The cost is expressed, both in pounds of steam, as ascertained by indicator measurement, and in pounds of coal, as found recorded in the steam-logs, consumed per horse-power per hour.

The number of pounds of steam given in the columns includes the quantity condensed in the cylinders in the production of the power; but the correction for known condensations due to other causes are not applied in Table I.

Inspection of the columns in which the cost of the power in coal is exhibited, will suffice to show the insufficiency of a comparison of the merits of the several engines with that quantity as a criterion. It is subject to such accidental conditions as cannot fail to render conclusions deduced from it erroneous.

It is preferred to accept the quantity of steam used as the correct measure for comparison. This quantity, computed from diagrams taken from the cylinders under ordinary circumstance of practice, is independent of all conditions that depend upon the performance of the boilers alone. In the second table the cost of the power developed by these engines, in pounds of steam per horse-power per hour, as measured by the indicator and corrected for the known condensations in the cylinder due to the production of the power and to other causes, is collated with the cost, ascertained in like manner, of the power developed severally by a number of English compound-engines of the latest and most approved construction.

The latter is the sum of the following quantities:

1. The number of pounds of steam per horse-power per hour discharged from the high-pressure cylinder, as measured by the indicator.

2. The number of pounds of steam per horse-power per hour condensed in the high-pressure cylinder in the production of the power, calculated upon the basis of Joule's equivalent.

3. The number of pounds of steam per horse-power per hour condensed in the steam-jackets, estimated upon the basis of an experiment made in 1860 with the pumping-engine of the Brooklyn Water-works.

It is assumed that the condensations in the high-pressure cylinder, due to causes other than the production of the power, are covered by the condensation in the steam-jackets. Whatever condensations occur, due to the difference of temperature between the interior surfaces of that cylinder and the entering steam, are countervailed by the re-evaporation of the water thereby precipitated upon those surfaces or suspended in the steam, and the water thus re-evaporated becomes available as steam for the development of power in the low pressure-cylinder.

The mean cost of the horse-power developed in the non-compound engines will compare with the mean cost of the horse-power in the compound engines, as follows:

1. Cost of the total horse-power of the non-compound engines, 28.46 pounds of steam; of the total horse-power of the compound engines, 19.05 pounds; the difference in favor of the latter, $\frac{28.46-19.05 \times 100}{28.46}=33.06$ per centum of the former.

2. Cost of the indicated horse-power of the non-compound engines, 31.75 pounds of steam; of the indicated horse-power of the compound engine, 22.46 pounds; the difference in favor of the latter, $\frac{31.75-22.46 \times 100}{31.75}=29.26$ per centum of the former.

3. Cost of the net horse-power of the non-compound engines, 40.83 pounds of steam; of the net horse-power of the compound engines, 27.18 pounds; the difference in favor of the latter, $40.83—27.18 \times 100=33.43$ per centum of the former. The indicated horse-power is the standard of comparison commonly employed in the current discussions of the performance of compound engines, although the net power would afford the rational standard. The gain of 29.26 per centum in the cost of the indicated power is much less than that usually claimed for the compound engines by persons interested in their manufacture. If, as is often asserted, the indicated horse-power is obtained at a cost of only two pounds of coal per hour, the boilers employed must evaporate 11.23 pounds of water per pound of coal. This quantity is much greater than has ever been evaporated by boilers of the types employed with the compound engines under consideration. The quantity of water evaporated in such boilers, per pound of coal, at the high rates of combustion generally employed in English practice, will be found not to exceed eight pounds of water from a temperature of 100° Fahrenheit. When the apparent evaporation is greater, the increase may be due to superheating the steam; the results of which practice would be equally advantageous in the case of engines of either type. The cost of the indicated horse-power, then, in pounds of coal per hour, would be $\frac{(22.46)}{8}=2.81$. Taking the evaporation of the boilers used with the non-compound engines, at their maximum rate of combustion, to be nine pounds of water to the pound of coal, the cost of the indicated horse-power, in pounds of coal, will be $\frac{31.75}{9}=3.53$. This quantity corresponds very nearly with the results recorded in the steam-logs of the engines in question when burning anthracite of good quality.

The difference in favor of the compound engines is, therefore $\frac{3.53-2.81\times100}{3.53}=20.39$ per centum of the cost of the indicated horse-power of the non-compound engines in pounds of coal per hour. The boiler-pressure employed with the compound engines in question, is sixty pounds per square inch above the atmospheric pressure. The employment of so high a pressure has occasioned the adoption of a type of boiler cylindrical in form, constructed of thicker plates than have been commonly used for marine purposes. This type is thought to promise some advantages over that hitherto preferred for the naval service. The latter is, for the most part, of the vertical water-tube variety, quadrangular in form, and unrivaled in economy of fuel. It has been found lacking in durability since the use of surface-condensers has become general. It is expected that from the greater facility with which means for the prevention of corrosion, both internal and external, may be applied, due to the greater simplicity of their construction, in the reduction of the bracing and otherwise, the cylindrical boilers may be made to render service for a longer period than those they will replace. For equal areas of grate-surface, however, the space occupied upon the floors of the vessels by cylindrical boilers of diameters practicable in naval vessels of the lesser rates, exceeds that occupied by boilers of the quadrangular form by about 30 per cent. of the latter. Reducing the grate-surface in proportion to the expected gain in net power developed, the space required for the cylindrical will be nearly the same as for the quadrangular form for the development of the same power with equal rates of combustion. With a saving of 30 per cent. in the cost of the net power developed by the engines of a sea-going steamer, there will be for corresponding rates of combustion a corresponding saving of space for the stowage of fuel for steaming any given distance.

A great deal has been written in the current engineering journals in discussion of the causes to which the gain accomplished is due. The explanation most generally accepted is that which refers the improved results to the greater facility with which steam of high pressure can be employed at high measures of expansion. This is vague and unsatisfying. For, the gain in economy does not increase in the ratio of the augmentation of the measure of expansion, or nearly so, even. There is really no correspondence between the gains that should result according to the law of the expansion of gases and the gains accomplished in the use of compound engines.

The practical measure of expansion that has been found most economical in cylinders working steam of low pressure into a condenser, is about two times the initial volume; or, more correctly, the measure due to cutting off the steam at four-tenths the stroke of the piston. The low-pressure cylinder of the compound engine works under precisely the same conditions as the cylinders of ordinary condensing-engines. The initial volume of the steam received by it per stroke of piston is governed by the capacity of the high pressure cylinder. If, therefore, a measure of two times the initial volume be employed in the low-pressure cylinder, that cylinder should have twice the capacity of the high-pressure cylinder. The high-pressure cylinder works under nearly the same condition as the cylinders of ordinary non-condensing engines. The practical measure of expansion that has been found most economical in working steam of 60 pounds pressure in cylinders of non-condensing engines is four times the initial volume.

Now the compound engine is essentially an arrangement by which two engines, a

non-condensing and a condensing engine, are conjoined; and the best results will be obtained from it when the steam is worked in its several cylinders with that measure of expansion which would be appropriate for either, were it detached and worked by itself. The several measures of expansion in the two cylinders are, then, the factors which make up the total measure effected, and this practical measure is (4 by 2 =) eight times the initial volume. To increase either of these factors by any considerable amount for the sake of effecting a higher total measure of expansion for the development of the same power, would result in a direct increase of the cost of the power.

With a given capacity of high-pressure cylinder, therefore, it would seem useless to employ a low-pressure cylinder of a relative capacity greater than two or two and a half times the former. The best examples of English compound engines have cylinders whose relative capacity is as one to three; and there are many in which the proportion is as one to four. That the low-pressure cylinders of the compound engines, whose performance is given in the tables, and the measures of expansion employed in them are too large for economy will appear if we compare the cost of the total horse-power developed in them alone with the cost of the total horse-power developed in the cylinders of the non-compound engines. The mean quantity representing that cost is, for the compound engines, inclusive of the quantity condensed in the steam-jackets, the benefit of which is obtained in the low-pressure cylinders, 31.02 pounds of steam. The difference is $\frac{31.02 - 28.46 \times 100}{28.46} = 9$ per centum of the latter in favor of the non-compound cylinders. This comparison is made with those compound engines only in which the powers developed in the several cylinders are nearest equality. Had the low-pressure cylinders been smaller, the ratio of the back to the gross effective pressure in them would have been reduced in a greater proportion than the ratio of the receiver to the gross effective pressure in the high-pressure cylinder would have been increased, and a direct gain accomplished by a decided reduction of the total measure of expansion, and the distribution of the power between the two cylinders would have been more nearly equalized.

Thus it appears that there is a considerable gain in economy to be expected from the adoption of the compound engine for the naval service, with no sacrifice of economy of space occupied.

Whether they will fulfill the requirements of the service in other respects as well as is done by the engines now in use is a question that can be determined only by experience. They are more complex in arrangement, and the details include a greater number of parts. At least one of the cylinders must be fitted with a separate cut-off valve and gear. There is a greater number of steam-joints, and hence, as well as from the higher pressures employed, a greater liability to leakage. The action of the cylinders depends each upon that of the other, and neither can be made to act by itself without the employment of special appliances of a complicated and normally useless character, in the absence of which the disabling of one cylinder means the disabling of both.

Against these apparently not insuperable disadvantages, we have to set the promised gain of 25.8 per centum in the indicated horse-power obtained from the same weight of fuel consumed, and the probable greater longevity of the boilers.

From the above considerations we conclude that the three classes of engines in question may be advantageously converted to the compound type; and we have, under the direction of the Bureau of Steam Engineering, entered upon the preparation of designs for the necessary changes. In these plans we are, of course, unable to follow exactly the English precedents. Designs of machinery for vessels of war are made under conditions that differ greatly from those that determine its arrangement and disposition in vessels of commerce.

And the difference in the character of the fuel commonly used in this country, from that used in Great Britain, enforces a variation in practice, so far as the boilers are concerned, entailing a necessity for the appropriation of rather more space in the vessels for that portion of the motive power. It is only by experience, as we have said, that the Department can test the actual value of the improved machinery for naval purposes, and determine its merit for adoption, to the exclusion of other types in the future. In the pursuit of economy the conspicuous modification of engineering practice is in the pressures of steam employed. There is nothing new in the compound engine except this feature.

The mere combination of mechanical devices that distinguish it from engines of the common type has never availed for the reduction of the cost of steam-power, although the attempt to compass that object by their use has been made many times; and, in our judgment, the new system should be tested by competition, with such modifications of that now in vogue as would result from the employment of the steam-jacket, and of the higher pressures and speeds of piston to which its superiority in economy is chiefly due.

To this end we would recommend that, besides converting the pair of 36 by 36 inch engines of the Swatara class, now stored at Portsmouth, N. H., to the compound type,

one of the pairs of engines of the same class, lately removed from the Swatara and the Nantasket, be adapted to the use of steam-pressure as shall be employed in the compound engines, by removing the cylinders and replacing them by others of reduced area of piston, fitted with steam-jackets, by making such other modifications as may be required for the greater speed of piston to be employed, and by furnishing boilers the same in kind and number as are proposed for the engines of the same class converted to the compound type.

A very considerable gain in economy of fuel is certain to result from these modifications, and it is also certain that the non-compound engines thus converted will be convenient of management, simple in construction, not specially liable to derangement, and capable of operating singly by simple disengagement in case of injury to either. Vessels now in course of construction will dispose of all the engines of the 50 by 42 inch, and the 36 by 36 inch engines now stored at the navy-yards. Of the 60 by 36 inch engines only one pair can be disposed of in like manner at present, the New York being the only vessel designated by the Department that will require engines of this size. These engines will always be available for vessels of from 2,500 to 3,000 tons displacement.

In Table III the probable speed of the several vessels in which the engines herein considered may be placed, is given, with the weights of engines, boilers, &c., the weight of coal that may be stored in the bunkers, and the probable weight required for twenty-four hours' consumption. In designing the boilers and their appendages for all the vessels now in course of construction, we have provided for means of hoisting and lowering the smoke-pipes. This is done in accordance with prevailing naval practice. We are, nevertheless, of the opinion that the use of telescopic smoke-pipes is detrimental to the economical performance of the boilers, not to speak of the hazard involved in the carrying about of a contrivance so liable to derangement from probable accident.

For active and efficient combustion of the fuel to be used in our vessels of war, a high chimney, without orifice for the admission of cold air, is a desideratum, and such pipes cannot well be arranged for lowering and hoisting at will.

We are, sir, very respectfully, your obedient servants,

CHAS. H. LORING,
Chief Engineer, U. S. Navy.
CHARLES H. BAKER,
Chief Engineer, U. S. Navy

HON. GEORGE M. ROBESON,
Secretary of the Navy.

TABLE I.—*Exhibiting, for comparison, the cost (in pounds) of steam per horse-power per hour of a number of compound and non-compound two-cylinder engines, the quantities for the former being computed from the pressure at the termination of the stroke of piston in the high-pressure cylinder, and for the latter from the pressure at the termination of the stroke of both pistons, as determined by indicator-measurement.*

Names of vessels.	Horse-power.			Pounds steam per horse-power per hour.			Pounds coal per horse-power per hour.		
	Total.	Indicated.	Net.	Total.	Indicated.	Net.	Total.	Indicated.	Net.
NON-COMPOUND ENGINES.									
H. B. M. S. S. Monarch	9,484.5	7,451.8	6,470.8	21.40	26.70	30.80	2.2	2.8	3.2
Monarch	2,676.4	1,875.7	1,257.9	17.50	25.00	37.30	.....	.....	.....
U. S. S. S. Minnesota	1,239.0	880.1	699.6	23.90	33.70	42.40	.....	.....	.....
Franklin	1,588.2	1,221.5	1,067.4	24.60	32.00	36.60	3.2	4.2	4.8
Franklin	1,414.2	1,214.7	1,072.2	25.40	29.60	33.60	3.6	4.2	4.8
Guerriere	981.9	838.9	741.2	24.10	28.20	31.90	3.6	4.3	4.8
Guerriere	836.5	645.7	549.2	22.50	29.10	34.30	4.0	4.8	5.4
Guerriere	1,456.5	1,145.5	1,037.3	24.60	31.30	34.60	2.8	3.5	3.9
California	831.2	698.0	595.2	24.50	29.00	34.30	3.1	3.6	4.3
Delaware	453.3	369.9	327.6	25.40	31.00	35.00	4.2	5.2	5.8
Delaware	1,000.8	777.2	684.7	26.70	34.40	39.10	3.2	4.2	4.6
Delaware	1,141.8	1,011.8	903.8	25.80	28.90	32.50	2.5	2.9	3.2
Congress	1,466.8	1,221.5	1,103.4	26.50	31.80	35.20	3.8	4.6	5.1
Congress	649.9	571.9	479.3	25.40	28.80	34.40	3.8	4.2	5.1
Albany	649.9	489.4	399.4	25.70	34.10	41.80	3.5	4.1	5.7
Worcester	769.7	583.1	476.7	25.80	34.10	41.70	4.2	5.5	6.7
Severn	510.7	461.7	382.1	28.70	31.80	38.40	.....	.....	.....
Niagara	1,200.0	823.5	623.6	24.50	35.80	47.20	5.4	7.8	10.4
Niagara	1,203.6	879.3	699.1	25.10	34.30	43.20	3.3	4.6	5.8
Pensacola	481.2	423.5	361.8	23.10	26.20	30.70	3.9	4.4	5.1
Pensacola	685.5	598.8	529.4	24.70	28.20	32.00	3.3	3.7	4.2
Plymouth	1,095.4	744.6	639.4	25.10	36.90	41.50	2.9	4.3	5.3
Alaska	607.5	476.9	406.0	23.40	29.80	35.00	4.2	5.4	6.4
Benicia	960.1	759.0	662.2	23.50	29.70	34.00	3.1	3.9	4.5
Canandaigua	512.7	423.2	372.8	24.40	29.60	33.60	2.3	2.8	3.2
Canandaigua	387.6	261.2	214.0	23.60	35.10	42.90	4.3	6.5	7.9
Canandaigua	633.5	507.6	454.1	23.60	29.50	33.00	3.9	4.9	5.5
Juniata	681.3	569.6	514.9	24.40	29.20	32.30	4.4	5.2	5.8
Lackawanna	608.6	483.1	435.8	23.20	29.20	32.40	3.6	4.6	5.0
Lackawanna	496.0	407.9	365.9	23.00	27.90	31.10	3.4	4.1	4.6
Lackawanna	374.1	323.7	283.3	23.50	27.10	31.00	4.2	4.8	5.5
Ossipee	358.5	293.8	250.7	25.60	31.30	36.70	3.2	3.9	4.6
Ossipee	253.6	216.4	178.6	25.50	29.90	36.30	3.9	4.6	5.5
Monongahela	394.3	336.8	294.5	23.20	27.20	31.10	2.6	3.1	3.5
Monongahela	193.2	149.0	114.4	23.10	29.90	39.00	3.1	4.0	5.2
Ticonderoga	572.9	502.9	451.5	23.80	27.20	30.30	3.2	3.7	4.1
Shenandoah	654.4	592.6	540.1	25.60	28.30	31.10	4.5	5.0	5.5
Swatara	503.3	405.9	355.1	23.00	28.60	32.70	5.2	6.5	7.4
Resaca	253.6	209.9	169.9	23.80	28.70	35.50	2.3	4.7	5.8
Pawnee	792.6	593.6	491.1	22.60	30.20	36.50	3.8	5.1	6.2
Nevada	5,397.7	4,480.9	4,177.3	24.60	29.60	31.80	.....	.....	.....
COMPOUND ENGINES.									
S. S. ——	1,522.4	1,221.5	1,013.3	17.70	22.30	26.56	2.0	2.5	3.0
Italy	2,324.4	2,050.3	1,714.8	18.23	20.60	24.71	1.6	1.8	2.1
Italy	2,002.2	1,748.3	1,415.8	16.74	19.16	23.65	1.7	1.9	2.3
Spain	2,931.9	2,512.8	2,131.5	17.00	19.78	23.32	.....	.....	.....
Spain	1,899.6	1,619.8	1,259.7	16.73	19.62	25.23	1.6	1.8	2.3
Spain	2,755.1	2,437.4	2,056.1	17.24	19.49	23.10	1.8	2.0	2.4
Spain	3,053.0	2,569.0	2,125.3	19.05	22.60	27.36	1.77	2.1	2.5
City of Bristol	1,500.9	1,307.9	1,062.9	17.10	19.62	24.91	.....	.....	.....
Gracia	683.0	640.8	535.2	18.80	20.13	24.29	.....	.....	.....
Patagonian	1,887.7	1,600.1	1,302.6	16.50	19.50	23.90	.....	.....	.....
Batavia	1,721.9	1,380.7	1,136.9	18.40	23.00	27.90	1.8	2.2	2.7
Egypt	4,086.7	3,280.0	2,774.6	18.50	23.13	27.13	1.4	1.8	2.1
U. S. C. S. S. Hassler	229.0	193.5	174.6	16.96	20.08	22.20	.....	.....	.....
Hassler	219.8	177.2	157.6	17.20	21.38	24.04	.....	.....	.....
Hassler	164.8	135.3	122.3	16.28	19.90	22.00	.....	.....	.....

TABLE II.—*Exhibiting, for comparison, the cost of the power, in pounds of steam per horse-power per hour, of a number of compound and non-compound two-cylinder engines; the quantities, as ascertained by indicator measurement, being corrected by adding, in the case of the non-compound engines, the known condensations in the cylinders, for their several measures of expansion, as determined by the experiments of the Navy Department; and in the case of the compound engines, the quantity condensed in the steam-jackets, as estimated upon the basis of an experiment made with the pumping-engine of the Brooklyn Water-Works, in* 1860.

Description of engine.	Pounds of steam consumed per hour per total horse-power, inclusive of the quantity condensed in the production of the power.	Pounds of steam condensed in the steam-jackets per total horse-power, calculated upon the basis of an experiment with the engine of the Brooklyn Water-Works.	Pounds of steam condensed per total horse-power, due to all causes other than the production of the power.	Cost of the power in pounds of steam per horse-power per hour.			Pounds of steam consumed per total horse-power, developed in the low-pressure cylinder, inclusive of the quantity condensed in the steam-jackets.
				Total.	Indicated.	Net.	
The 60x36 in. Navy engines of the U. S. steamers—							
Guerriere	23.67	.....	4.99	28.66	35.70	40.56	.....
Delaware	25.96	.....	4.00	29.96	36.40	41.03	.....
California	24.50	.....	5.10	29.60	35.40	41.00	.....
Congress	25.95	.....	4.40	30.35	35.55	40.85	.....
The 50x42 in. Navy engines of the U. S. steamers—							
Alaska	23.40	.....	4.10	27.70	35.30	41.40	.....
Benicia	23.50	.....	4.30	27.80	35.20	40.20	.....
The 36x36 in. Navy engines of the U. S. steamers—							
Resaca	23.80	.....	5.00	28.80	34.80	43.00	.....
Swatara	23.00	.....	4.20	27.20	33.70	38.60	.....
The compound engines of the steamers—							
.....	15.90	2.18	.....	18.08	22.53	27.16	29.18
Italy	16.70	2.18	.....	18.88	21.49	26.10	31.57
Spain	16.60	2.16	.....	18.76	21.85	26.54	32.77
City of Bristol	16.20	2.11	.....	18.31	21.01	25.85	28.07
Gracia	18.30	2.32	.....	20.62	21.97	26.31	.....
Patagonian	15.90	2.04	.....	17.94	21.16	25.99	29.42
Batavia	17.60	2.27	.....	19.87	24.78	30.09	34.14
Egypt	17.70	2.28	.....	19.98	24.89	29.42	32.00
Mean of the—							
60x30 in. engines	25.02	.....	4.62	29.64	35.76	40.86	.....
50x42 in. engines	23.45	.....	4.20	27.75	35.25	40.85	.....
36x36 in. engines	23.40	.....	4.60	28.00	34.25	40.80	.....
Mean of the—							
Navy engines	23.95	.....	4.47	28.46	31.75	40.83	.....
Compound engines	16.86	2.19	.....	19.05	22.46	27.18	31.02

TABLE III.

Class of vessel.	Length in feet.	Breadth in feet.	Draught of water in feet, (from base line.)	Diameter of cylinder		Stroke of piston, in feet.	Number of boilers.	Grate-surface in boilers, in feet.	Weight of engine, in tons of 2,240 lbs.	Weight of boilers, including water, in tons of 2,240 lbs.	Weight of appendages to engines and boilers, in tons of 2,240 lbs.	Weight of coal in bunkers, in tons of 2,240 lbs.	Tons of coal per twenty-four hours.	Indicated horse-power (maximum.)	Immersed midship-section.	Speed of vessel in knots per hour.
				High pressure.	Low pressure.											
New York	315	47	18.0	59.0	80	3.0	10	390	216.0	286	94.2	300	52.0	1,780	733′.0	12.0
Quinnebaug	216	37	14.0	42.0	64	3.5	10	240	153.0	145	47.0	175	34.0	1,130	447′.0	12.0
Small iron sloops, 1873	175	32	11.5	29.0	45	3.0	5	120	64.75	80	39.7	120	17.0	560	335′.5	10.5
Iron sloops, 1873, with high-pressure non-compound engines	175	32	11.5	21.5	....	3.0	5	120	62.0	80	39.7	120	18.4	560	335′.5	10.5

Compound engines have never been used in vessels of the United States Navy, but have, however, been largely introduced in steamers of the commercial marine, and from the most reliable data the Bureau has been able to obtain, the method of using steam of high pressures and expanding in separate cylinders (one or more in number, depending upon the power to be transmitted,) is more economical and advantageous in its *practical* application than by the former method in single-cylindered engines with the pressures heretofore used in such cylinders.

50 INCH BY 42 INCH ENGINES—QUINNEBAUG CLASS.

The uncompleted engines (known as 50 inch by 42 inch) stored at several of the navy-yards, for which an appropriation was made by the last Congress to convert into compound engines and complete for the Marion, Vandalia, Swatara, Quinnebaug, Galena, and others, are well advanced towards completion. One pair at the navy-yard, Brooklyn, are nearly ready for erection on board the Swatara, and the other pair will be ready for the Quinnebaug in about two months. The delay in the latter has been in consequence of the failure to obtain iron of the proper quality for construction of the boilers. At the Charlestown navy-yard two pairs of these engines are nearly ready for erection, one for the Marion at Portsmouth, and the other for the Vandalia at Charlestown. Designs are in hand for two pairs of the same size and power for the Galena at Norfolk and the Mohican at Mare Island, the boilers for which have already been commenced.

MACHINERY FOR STEAM-VESSELS OF WAR.

The desire of the Department, in constructing the machinery for the new sloops-of-war authorized by act of Congress, approved February 10, 1873, was, that it should be of the very best type and design which the experience and practice of the day should have demonstrated to be the most perfect and best adapted to the propulsion of said vessels; and in order to avail itself of the experience and suggestions of the engineering profession of the entire country, proposals were solicited by advertisement for designs with the necessary specifications for the machinery required in vessels of 620 and 450 tons. All the information required by the designers in adapting the machinery to the vessel, power to be developed, &c., was furnished by the Bureau to such as applied therefor. The merits of the plans presented were to be determined by a board of competent engineers, and a reasonable compensation was to be paid for such designs as were adopted, either as a whole or in part.

Under this advertisement five plans were presented and referred to the board appointed under the following order of the Department:

NAVY DEPARTMENT,
Washington, D. C., June 18, 1873.

GENTLEMEN: You are hereby appointed a board to examine the plans and specifications received at this Department in conformity with an advertisement soliciting designs for steam-machinery under date of May 5, 1873.

Your attention is respectfully called to this advertisement and its requirements, in view of adopting for the vessels to be constructed for the Navy the best type of steam-machinery which modern practice has proved most economical and efficient, and that which can be most advantageously used in the propulsion of steam vessels of war, taking into consideration weight, space allowed, power developed, economy, arrangement of design for access of attendance and repairs, &c., &c.

You will carefully examine such designs and specifications as may have been sub

mitted under the advertisement, and report which of them, if any, are superior to the designs emanating from the Bureau of Steam Engineering, either in whole or in part, and if any possess novel features which in the opinion of the board should be used, and that may be embodied in the design finally recommended for adoption.

You will further report such compensation as may be, under the terms of the advertisement, properly awarded for the designs, in whole or in part, or that in your opinion considered best for the uses and requirements of steam vessels of war for the Navy, that may have been submitted under the advertisement.

Respectfully,

GEO. M. ROBESON,
Secretary of the Navy.

CHAS. H. LORING,
Chief Engineer, U. S. N.
CHAS. H. BAKER,
Chief Engineer, U. S. N.
ERASTUS W. SMITH, *A. D. D.*

After mature deliberation and consideration of the several plans presented, this board made the following report:

WASHINGTON, D. C., *June* 30, 1873.

SIR: In compliance with instructions contained in the communication of the Navy Department, dated June 18, 1873, we have carefully examined such designs and specifications as have been submitted in conformity with the terms of an advertisement soliciting designs for steam-machinery under date of May 5, 1873. The origin and character of these designs are as follows:

Of steam-machinery complete for vessels of the larger class designated in the advertisement:

1. One design for non-compound engines from Messrs. Lincoln & Rheuter, of Portsmouth, N. H.
2. One design of compound engines from Mr. T. Main, of New York.
3. One design of compound engines from Mr. William Wright, of Newburgh, N. Y.

Of engines alone:

4. One design of non-compound engines from Mr. E. S. Brady, of Jersey City, N. J., of boilers alone.
5. One design from Mr. C. E. Emery, of New York.

No designs of machinery adapted to use in vessels of war of the lesser class designated in the advertisement were submitted.

We do not find that any of the designs enumerated above are superior to those emanating from the Bureau of Steam Engineering, and we recommend the adoption of the latter, with the following modifications, viz, the increase of the diameter of the air-pump piston to 12 inches, and the use of a "built-up" crank, with counterbalances, instead of the disk-counterbalances originally proposed.

We find that among the designs submitted, and not recommended for acceptance, that of Thomas Main, of New York, is entitled to preference, and we recommend that the sum of $500 be paid as compensation for his, as the best rejected design. This design also embodied a method of balancing the momentum of the reciprocating parts of the engines, elsewhere recommended herein as a modification of the designs prepared at the Bureau, for which, in our judgment, he is entitled, under the terms of the advertisement and the instructions of the Department, to an award of $500.

We are, sir, very respectfully, your obedient servants,

CHAS. H. LORING,
Chief Engineer, U. S. N.
CHAS. H. BAKER,
Chief Engineer, U. S. N.
ERASTUS W. SMITH.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

It will thus be seen that no design presented was considered by the board, as a whole, preferable to those emanating from this Bureau, and upon this recommendation the designs of the Bureau were adopted, proposals to construct and erect the machinery and boilers were received, and the same placed under contract as follows: With the

Atlantic Works, Boston, Mass., one pair engines, 800 horse-power, for $175,000; contract dated August 16, 1873.

Atlantic Works, Boston, Mass., one pair engines, 800 horse-power, for $163,000; contract dated August 16, 1873.

James Murphy & Co., New York, one pair engines, 800 horse-power, for $175,000; contract dated September 11, 1873.

John Roach, New York, one pair engines, 560 horse-power, for $120,000; contract dated September 11, 1873.

Woodruff Iron Works, Hartford, Conn., one pair engines, 800 horse-power, for $175,000; contract dated October 4, 1873.

A contract was also made with W. Wright & Co., Newburgh, N. Y., for the construction and erection of one pair engines, same design, 800 horse-power, for the Nipsic, for $175,000; contract dated September 11, 1873.

All of the above are to be completed within six months from date of their respective contracts, and erected on board vessels within three months from the time that they shall be notified that the vessel is ready, after such completion.

INTERNAL CORROSION OF NAVAL BOILERS.

By careful analysis made at the naval laboratory, Brooklyn, the rapid corrosion of boilers in steam-vessels of the Navy using surface-condensers, has been found to be caused by oleate of copper formed in the condenser, from which it passes into the boilers, where it is slowly transformed into oleate of iron, deriving the iron from different parts of the boiler with which it comes in contact, and precipitating its copper. The oleate of copper adhering to the iron under the conditions of high pressures and temperatures, the deposition of copper and the absorption of the iron begin.

To prevent this rapid deterioration of steam-boilers, an apparatus has been devised and patented by Mr. W. C. Selden, of New York, which has been introduced in several steamers of the merchant marine. This invention consists in a method of arresting the destructive agents formed in the condenser, and preventing their introduction into the boilers. It has been introduced in a few of the steamers of the Navy, and the reports as to its value and efficiency for the purposes for which applied are highly favorable, promising great success in prolonging the life-time of boilers to which it may be applied.

SCREW-PROPELLERS.

In many cases the original screws of four blades were removed from our naval steamers, and screws of two blades substituted. These changes were determined upon by the Department, with a view to rendering such vessels more efficient while under sail alone, by the supposed decreased resistance opposed to the vessel by screws of two blades, rather than those with four. In all cases where this change has been made, reports are received of the inefficiency of the two-bladed screw, as compared with those of four blades with which these vessels were originally fitted. With equal propelling-surface, no advantage whatever can be derived from using a screw of two instead of four blades, while under sail alone, because, when screws are uncoupled and revolving freely, screws of four blades oppose no greater resistance to the vessel than one of two. When fixed and held stationary, in a vertical position behind the stern-post, the loss of speed due to the resistance of the screw, expressed in percentages of the speed, has been determined by careful experiments to be 18.29 per cent., while the four or

two bladed screw revolving freely by pressure of the water gives a resistance of only 9.96 per cent., being very nearly two to one in favor of the revolving screw.

The shocks caused to the vessel by the blades passing the stern-post are diminished as the number of blades is increased; the four-bladed screw producing less vibration in the ship than one of three, and one with three blades less than one with two.

The propelling efficiency of a screw is entirely independent of the number of its blades, but is wholly dependent upon the area, the pitch, the fraction of the pitch used, and the area of the circle described by the blades.

To diminish the shocks and vibration more or less incidental to the use of the screw-propeller, the largest amount of clearance admissible for the screw between the stern and rudder-posts should be given. It is obvious, then, that a port intended for a screw whose area is contained in four blades cannot receive a screw of two blades having the same area, pitch, and fraction of the pitch, for that screw must be just double the length of the former in the line of its axis. Consequently, the two-bladed screws which were substituted for those of four blades were necessarily constructed of less propelling areas, as the port-openings of the vessels could not be enlarged. Hence, the inefficiency of the screws substituted as reported.

ENGINEER FORCE ON SHIPBOARD.

In the quarterly reports of the steam departments of vessels in commission come many complaints of the inefficiency of this force under its present organization. In some cases the machinists have been trustworthy and reliable, but in many others they have been the opposite, leading us to believe that the position given them in the service is not of sufficient importance to induce the class of men that is really needed to perform this duty to accept these rates.

Except in certain cases, *firemen* no longer exist on our vessels of war, and their places are taken by men known as "seamen, engineer force," and "ordinary seamen, engineer force." It was expected that the old firemen would enlist under these new rates and regulations, and at first, to a certain extent they did. That time, however, seems to have passed, and these rates are now frequently given to men who know little or nothing about the duties of firemen. From one ship a statement is made that one of the "ordinary seamen, engineer force," had never been at sea, and that he had never before used firing-tools. A large proportion of these reports make similar statements regarding the inefficiency of these men as firemen, and also the short time they are allowed below in the engineering department, being called on deck for various drills at all hours of the day.

I would respectfully suggest that as many first and second class firemen as would together be able to do duty as oilers and properly fire all the furnaces, be shipped for duty in the steam department only, and that, when steaming, landsmen be taken from deck for coal-heavers.

The estimates for the year will be found in the accompanying papers.

Very respectfully, your obedient servant,

WM. W. W. WOOD,
Chief of Bureau.

Hon. GEO. M. ROBESON,
Secretary of the Navy.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1875, *by the Bureau of Steam Engineering.*

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1874.
SALARIES.		
Chief clerk, per act of July 5, 1862, (12 Stat. at L., p. 511, sec. 3)	$1,800 00	.....
Draughtsman, per act of July 5, 1862, (12 Stat. at L., p. 511, sec. 3,) and March 2, 1867, (14 Stat. at L., p. 450, sec. 1)	1,800 00	.....
One clerk of class two, per act of March 2, 1867, (14 Stat. at L., p. 450, sec. 1)	1,400 00	.....
One assistant draughtsman, per act of July 5, 1862, (12 Stat. at L., p. 511, sec. 3)	1,200 00	.....
*One assistant draughtsman; (submitted)	1,200 00	.....
One messenger, per act of July 5, 1862, (12 Stat. at L., p. 511, sec. 3,) and July 12, 1870, (16 Stat. at L., p. 250, sec. 3)	840 00	.....
One laborer, per act of July 5, 1862, (12 Stat. at L., p. 511, sec. 3,) and July 12, 1870, (16 Stat. at L., p. 250, sec. 3)	720 00	.....
	8,960 00	$7,760
CONTINGENT EXPENSES.		
Stationery and miscellaneous items, (appropriated)	1,000 00	800 00
PUBLIC PRINTING AND BINDING.		
For printing and binding, to be executed under the direction of the Congressional Printer, per act of March 8, 1872, (17 Stat. at L., p. 82, sec. 2)	3,000 00	3,000 00
STEAM-MACHINERY.		
Repairs and preservation of machinery, boilers, &c., on all naval steam-vessels, (appropriated)	†1 500,000 00	1,000,000 00
Fitting, repairs, and preservation of machinery and tools in the several navy-yards, (appropriated)	50,000 00	50,000 00
Labor in navy-yards and stations, not included above, and incidental expenses, (appropriated)	100,000 00	100,000 00
Purchase and preservation of oils, coals, iron, and all material and stores, (appropriated)	‡500,000 00	400,000 00
Completing and erecting on board vessels five pairs of compound engines, with boilers, &c., complete, (appropriated)	§300,000 00	750,000 00
	2,450,000 00	2,300,000 00
CIVIL ESTABLISHMENT.		
At the navy-yard, Portsmouth, N. H.:		
Draughtsman, at $1,600; clerk to chief engineer, and store-clerk, at $1,400 each; and time-clerk, at $1,200; in all, (appropriated)	$5,600 00	.....
At the navy-yard, Charlestown, Mass.:		
Draughtsman, at $1,600; clerk to chief engineer, and store-clerk, at $1,400 each; and time-clerk, at $1,200; in all, (appropriated)	5,600 00	.....
At the navy-yard, Brooklyn, N. Y.:		
Draughtsman, at $1,600; clerk to chief engineer, and store-clerk, at $1,400 each; and time-clerk, at $1,200; in all, (appropriated)	5,600 00	.....
At the navy-yard, Philadelphia, Pa.:		
Draughtsman, at $1,600; clerk to chief engineer, and store-clerk, at $1,400 each; and time-clerk, at $1,200; in all, appropriated)	5,600 00	.....
At the navy-yard, Washington, D. C.:		
Draughtsman, at $1,600; clerk to chief engineer, and store-clerk, at $1,400 each; and time-clerk, at $1,200; in all, (appropriated)	5,600 00	.....
At the navy-yard, Norfolk, Va.:		
Draughtsman, at $1,600; clerk to chief engineer, and store-clerk, at $1,400 each; and time-clerk, at $1,200; in all, (appropriated)	5,600 00	.....
At the navy-yard, Pensacola, Fla.:		
Clerk of store-houses, at $1,200; increase submitted, $200, (appropriated)	1,400 00	.....
At the navy-yard, Mare Island, Cal.:		
Draughtsman, at $1,600; clerk to chief engineer, and store-clerk, at $1,400 each; and time-clerk, at $1,200; in all, (appropriated)	5,600 00	.....
	40,600 00	$40,400 00

*The services of an assistant draughtsman are necessary to assist in copying and restoring drawings injured by the late fire in the Navy Department.

† The increase of $500,000 in this item is absolutely needed for the purpose of rebuilding and repairing boilers on board vessels, which boilers are now almost unserviceable.

‡ This estimate is based upon actual wants, as shown by schedules received from the several navy-yards.

§ The former appropriation did not include cost of erecting on board vessels.

‖ This increase is recommended, as this clerk has to act as chief engineer's, store, and time clerk, and $1,400 is the pay of store-clerk at all the other yards.

No. 10.

BUREAU OF CONSTRUCTION AND REPAIR.

NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR,
November 5, 1873.

SIR: I have the honor to forward, in compliance with your instructions, the estimates for appropriations for the annual expenditures for the fiscal year commencing July 1, 1874, coming under the cognizance of the Bureau of Construction and Repair.

Estimates in tables marked A and B are for the pay of employés attached to this Bureau, and at the several navy-yards, as authorized by law.

Estimate in table marked C is for the preservation of vessels on the stocks and in ordinary; purchase of materials and stores of all kinds; labor in navy-yards and on foreign stations; preservation of material; purchase of tools; wear and tear and repair of vessels afloat, and general maintenance of the Navy; incidental expenses and foreign postage.

Estimate in table marked D is for the preservation of live-oak timber upon Government lands reserved for naval purposes.

I beg leave to call your attention to the inclosed list of vessels which have been repaired during the past year, by which it will be seen that a very large number in proportion to the whole are deteriorating, and their days of usefulness are rapidly passing away.

It may be seen by official statistics that the loss of vessels by wear, tear, and the disasters of the sea is equal to 10 per cent. per annum, and that that percentage must be supplied in new vessels every year to keep the original number up.

Although Government vessels are built generally of more durable materials than those of the merchant marine, the causes for deterioration in the former are greater than in those of the latter; consequently, if that percentage is not supplied in new vessels to the Navy, there is either a diminution in the number of vessels, or the number can only be kept up by extensive and costly repairs, the course pursued heretofore. But the expenditure would produce a better result if the number of vessels equal to this loss were constructed every year, as it would afford an opportunity for adopting all the improvements of the day, and thus, in proportion to the number, equal other nations in the efficiency of our Navy.

The eight steam-sloops authorized by act of Congress are in process of construction, and their completion will be hastened with due regard to economy.

The vessels built under the act above named will meet the pressing wants of the Government required of that particular class, but in any emergency, when especially a demand has to be made for redress, or for the immediate protection of the rights of our citizens abroad, naval vessels of more formidable character are required.

A number of the most available iron-clads have been repaired, and are nearly ready for sea, but a number of the most power require very extensive and expensive repairs, which, owing to the limited amount of past appropriations, have not been made. These double-turreted iron-armored vessels should be repaired immediately, as their services may be needed in any sudden emergency.

Large and powerful sea-going iron-clads, whose power for resistance and attack may be graded from their origin to that of the latest and

most approved of the present day, seem to form the principal strength of all important maritime nations; and of which those of the monitor type are considered the most formidable, inasmuch as they present less surface for iron plating in proportion to their displacement than that of any other form. Of the above type there are a number which can be improved and repaired, making very efficient vessels, and which, until the power of ordnance, the resistance of practical iron armor, and the effect of the submerged torpedo is fully developed, would, it is thought, be sufficient.

Foreign nations seem to be gradually comprehending the future of a transition of naval iron-clads to the *swift*, invulnerable torpedo-vessel, whose power to destroy any of the most formidable and reliable vessels of war is not disputed.

The torpedo appears to be the most terrible and destructive implement of warfare ever brought into use upon the ocean, and many objections are urged against its barbarous effect, yet there seems to be no difference, in a moral point of view, in sinking a vessel and all on board with it than by the shot of a 20-inch gun, fired behind an invulnerable breastwork.

With the device for using torpedoes, already well demonstrated, a sufficient number of these invulnerable swift vessels need only to be built to carry on a successful warfare with any nation known; and our harbors can easily be protected from an enemy without the expensive fortifications now in process of erection.

Very respectfully, your obedient servant,

I. HANSCOM,
Chief of Bureau.

Hon. GEORGE M. ROBESON,
Secretary of the Navy.

Vessels repaired at the different navy-yards during the fiscal year 1872–'73, *under the cognizance of the Bureau of Construction and Repair.*

Dacotah.
Independence.
Jamestown.
Kearsarge.
Monadnock.
Mohican.
Monterey.
Nyack.
Resaca.
Saranac.
Tuscarora.
Vanderbilt.
Blue Light.
Marion.
Monongahela.
Plymouth.
Brooklyn.
Cohasset.
Connecticut.
Franklin.
Iowa.
Juniata.
Leyden.
Miantonomah.
Niagara.
Ohio.
Oregon.
Pennsylvania.
Powhatan.
Severn.
Shawmut.
Vandalia.
Virginia.
Wassuc.
Alaska.
Guard.
Kansas.
Minnesota.
Ossipee.
Portsmouth.
Swatara.
Supply.
Tennessee.
Tigress.
Ajax.
Antietam.
Constitution.
Glance.
Manhattan.
Nebraska.
Omaha.
Pilgrim.
Pinta.
Potomac.
Quinnebaug.
Richmond.
St. Louis.
Sorrel.
Terror.
Fortune.
Frolic.
Gettysburg.
Nipsic.
Relief.
Rescue.
Shawmut.
Tallapoosa.
Triana.
Constellation.
Galena.
Jean Sands.
Mahopac.
New Hampshire.
Powhatan.
Richmond.
Saugus.
Snow Drop.
Standish.
Savannah.
Worcester.
Benicia.
California.
Camanche.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1875, *by the Bureau of Construction and Repair.*

Detailed object of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1874.
A.		
SALARIES.		
Chief clerk, per act of July 5, 1862, (12 Stat. at L., p. 511, sec. 3)	$1,800 00	.....
Draughtsman, per act of March 2, 1867, (14 Stat. at L., p. 450, sec. 1)	1,800 00	.....
One clerk of class four, per act of July 23, 1866, (14 Stat. at L., p. 207, sec. 8)	1,800 00	.....
Two clerks of class three, per act of July 23, 1866, (14 Stat. at L., p. 207, sec. 8)	3,200 00	.....
Two clerks of class two, per act of July 23, 1866, (14 Stat. at L., p. 207, sec. 8)	2,800 00	.....
One messenger, per acts of July 5, 1862, (12 Stat. at L., p. 511, sec. 3,) and March 3, 1869, (15 Stat. at L., p. 287, sec. 1)	840 00	.....
One laborer, per acts of July 5, 1862, (12 Stat. at L., p. 511, sec. 3,) and March 3, 1869, (15 Stat. at L., p. 287, sec. 1)	720 00	.....
	12,960 00	$12,960 00
CONTINGENT.		
Stationery and miscellaneous items, appropriated, (16 Stat. at L., p. 493, sec. 1)	800 00	800 00
PRINTING AND BINDING.		
Printing and binding, to be executed under the direction of the Congressional Printer, (appropriated)	10,000 00	.....
B.		
CIVIL ESTABLISHMENT.		
At the navy-yard, Kittery:		
Clerk of store-houses, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 8)	1,500 00	.....
Clerk to naval constructor, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 8)	1,400 00	.....
Time-clerk, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 8)	1,400 00	.....
Draughtsman to naval constructor, (appropriated, Stat at L., pamphlet edition, p. 21, sec. 8)	1,400 00	.....
Inspector of timber, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 8)	1,400 00	.....
Superintendent of floating-dock, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 8)	1,400 00	.....
Increase of salary of draughtsman, (submitted)	200 00	.....
	8,700 00	.....
Reduction of salary of clerk of store-houses, (submitted)	100 00	.....
	8,600 00	8,500 00
At the navy-yard, Charlestown:		
Clerk of store-houses, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 9)	1,200 00	.....
Clerk to naval constructor, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 9)	1,500 00	.....
Time-clerk, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 9)	1,500 00	.....
Draughtsman to naval constructor, (appropriated, Stat., at L., pamphlet edition, p. 21, sec., 9)	1,400 00	.....
Inspector of timber, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 9)	1,500 00	.....
Increase of salary of clerk of store-houses, (submitted)	300 00	.....
Increase of salary of draughtsman, (submitted)	200 00	.....
	7,600 00	7,100 00
At the navy-yard, Brooklyn:		
Clerk of store-houses, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 10)	1,200 00	.....
Clerk to naval constructor, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 10)	1,500 00	.....
Time-clerk, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 10)	1,500 00	.....
Draughtsman to naval constructor, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 10)	1,400 00	.....
Inspector of timber, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 10)	1,500 00	.....
Increase of salary of clerk of store-houses, (submitted)	300 00	.....
Increase of salary of draughtsman, (submitted)	200 00	.....
	7,600 00	7,100 00

Estimates of appropriations required by the Bureau of Construction and Repair, &c.—Cont'd.

Detailed object of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1874.
CIVIL ESTABLISHMENT—Continued.		
At the navy-yard, Philadelphia:		
Clerk of store-houses, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 11)	$1,200 00	.....
Clerk to naval constructor, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 11)	1,400 00	.....
Time-clerk, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 11)	1,400 00	.....
Draughtsman to naval constructor, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 11)	1,400 00	.....
Inspector of timber, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 11)	1,400 00	.....
Superintendent of floating-dock, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 11)	1,400 00	.....
Increase of salary of draughtsman, (submitted)	200 00	.....
Increase of salary of clerk of store-houses, (submitted)	200 00	.....
	8,600 00	*$8,700 00
At the navy-yard, Washington:		
Clerk of store-houses, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 12)	1,200 00	.....
Clerk to naval constructor, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 12)	1,200 00	.....
Time-clerk, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 12)	1,200 00	.....
Inspector of timber, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 12)	1,200 00	.....
Draughtsman to naval constructor, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 12)	1,400 00	.....
Increase of salary of clerk to naval constructor, (submitted)	200 00	.....
Increase of salary of clerk of store-houses, (submitted)	200 00	.....
Increase of salary of draughtsman, (submitted)	200 00	.....
	6,800 00	6,200 00
At the navy-yard, Norfolk:		
Clerk of store-houses, (appropriated, Stat. at L., pamphlet edition, p. 22, sec. 1)	1,400 00	.....
Time-clerk, (appropriated, Stat. at L., pamphlet edition, p. 22, sec. 1)	1,200 00	.....
Draughtsman to naval constructor, (appropriated, Stat. at L., pamphlet edition, p. 22, sec. 1)	1,400 00	.....
Salary of clerk to naval constructor, (submitted)	1,400 00	.....
Salary of inspector of timber, (submitted)	1,400 00	.....
Increase of salary of draughtsman, (submitted)	200 00	.....
Increase of salary of time-clerk	200 00	.....
	7,200 00	4,000 00
At the navy-yard, Pensacola:		
Clerk of store-houses, (appropriated, Stat. at L., pamphlet edition, p. 22, sec. 2)	1,400 00	1,400 00
At the navy-yard, Mare Island:		
Clerk of store-houses, (appropriated, Stat. at L., pamphlet edition, p. 22, sec. 3)	1,500 00	.....
Clerk to naval constructor, (appropriated, Stat. at L., pamphlet edition, p. 22, sec. 3)	1,500 00	.....
Time-clerk, (appropriated, Stat. at L., pamphlet edition, p. 22, sec. 3)	1,500 00	.....
Inspector of timber, (appropriated, Stat. at L., pamphlet edition, p. 22, sec. 3)	1,500 00	.....
Draughtsman to naval constructor, (appropriated, Stat. at L., pamphlet edition, p. 22, sec. 3)	1,400 00	.....
Superintendent of floating-dock, (appropriated, Stat. at L., pamphlet edition, p. 22, sec. 3)	1,500 00	.....
Increase of salary of draughtsman, (submitted)	200 00	.....
	9,100 00	8,900 00
	56,900 00	51,900 00
Increase, &c., submitted	.....	5,600 00
		57,500 00
Submitted reduction, clerk of store-houses, Kittery	.....	100 00
		57,400 00

* The remaining difference of $500 is occasioned by the aggregate of the several salaries for the Philadelphia yard being stated in the appropriation act as $8,700, instead of $8,200, the correct addition of the several sums.

Estimates of appropriations required by the Bureau of Construction and Repair, &c.—Continued.

Detailed object of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1874.
CIVIL ESTABLISHMENT—Continued.		
The difference between the amount appropriated for the fiscal year ending June 30, 1874, and the amount required for the fiscal year ending June 30, 1875, arises from:		
Submitted increase of salary of draughtsman at Kittery	$200 00	.....
Submitted increase of salary of clerk of store-houses at Charlestown	300 00	.....
Submitted increase of salary of draughtsman at Charlestown	200 00	.....
Submitted increase of salary of clerk of store-houses at Brooklyn	300 00	.....
Submitted increase of salary of draughtsman at Brooklyn	200 00	.....
Submitted increase of salary of draughtsman at Philadelphia	200 00	.....
Submitted increase of salary of clerk of store-houses at Philadelphia	200 00	.....
Submitted increase of salary of clerk to naval constructor at Washington	200 00	.....
Submitted increase of salary of clerk of store-houses at Washington	200 00	.....
Submitted increase of salary of draughtsman at Washington	200 00	.....
Submitted for salary of clerk to naval constructor at Norfolk	1,400 00	.....
Submitted for salary of inspector of timber at Norfolk	1,400 00	.....
Submitted increase of salary of draughtsman at Norfolk	200 00	.....
Submitted increase of salary of time-clerk at Norfolk	200 00	.....
Submitted increase of salary of draughtsman at Mare Island	200 00	.....
	5,600 00	.....
Submitted reduction of salary of clerk of store-houses at Kittery	100 00	.....
	5,500 00	.....
C.		
CONSTRUCTION AND REPAIR OF VESSELS.		
Preservation of vessels on the stocks and in ordinary; purchase of materials and stores of all kinds; labor in navy-yards and on foreign stations; preservation of material; purchase of tools; wear, tear, and repair of vessels afloat, and general maintenance of the Navy; incidental expenses, advertising and foreign postages, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 6)	3,500,000 00	$3,500,000 00
Construction of eight steam-vessels of war, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 5)	.....	3,200 000 00
PROTECTION OF IRON-CLADS.		
Repair and preservation of iron-clads, (submitted)	600,000 00	.....
D.		
PROTECTION OF TIMBER-LANDS.		
Salaries of sub-agents and watchmen, and miscellaneous expenses, (appropriated, Stat. at L., pamphlet edition, p. 21, sec. 7)	5,000 00	5,000 00

BUREAU OF CONSTRUCTION AND REPAIR, *September* 1, 1873.

Offers to furnish and deliver 25,000 *pounds ingot-copper, "lake," at the Washington navy-yard, under advertisement of the Bureau of Construction and Repair, March* 17, 1873.

David Babcock & Co	$8,700 00
Joseph L. Savage	8,972 50
*Holmes & Lissberger	8,562 50

Opened in presence of—

I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*

NAVY DEPARTMENT, BUREAU OF CONSTRUCTION AND REPAIR, *April* 8, 1873.

*Accepted.

Offers to furnish and deliver 50,000 *cubic feet of live-oak timber at either the Kittery, Charlestown, or Brooklyn navy-yard, or such proportion of the amount at either yard as the Department may direct, made under the advertisement of the Bureau of Construction and Repair of March* 19, 1873.

	Principal pieces per cubic foot.	Curved timber per cubic foot, 13 and 15 inch.	Curved timber per cubic foot, 12 inch.	Straight timber.
S. P. Brown	$1 40	$1 69	$1 90	$1 35
James Bigler & Co	1 75	1 50	1 50	1 20
* W. C. N. Swift	†2 00	†1 70	†1 70	†1 40

*Received after time.
† Ten cents per cubic foot to be added for deliveries at Charleston and Kittery.

[Neither of the above offers was accepted.]

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*

NAVY DEPARTMENT, BUREAU OF CONSTRUCTION AND REPAIR, *April* 17, 1873.

Offers to furnish and deliver live-oak timber in quantities of from 3,000 *to* 25,000 *cubic feet at each of the navy-yards, Charlestown and Brooklyn, made under the advertisement of the Bureau of Construction and Repair of March* 19, 1873.

	Principal pieces per cubic foot	Curved timber per cubic foot.	Straight timber per cubic foot.
S. P. Brown	$1 79	$1 79	$1 79
James Bigler & Co	†2 00	†1 70	†1 40
* W. C. N. Swift	†2 00	†1 70	†1 40

*Received after time.
† For deliveries required to be made at Charleston or Kittery ten cents per cubic foot to be added.

[The offer of J. Bigler & Co. was accepted for 25,000 cubic feet, deliverable at Brooklyn and Kittery; and of W. C. N. Swift for the same quantity, deliverable at Brooklyn and Charlestown.]

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*

NAVY DEPARTMENT, BUREAU OF CONSTRUCTION AND REPAIR, *April* 17, 1873.

Offers to furnish and deliver 50,000 *pounds ingot-copper at the Washington navy-yard, under advertisement of the Bureau of Construction and Repair of May* 10, 1873.

* Holmes & Lissberger	$16,250
David Babcock & Co	16,600
C. C. Douglass	17,000
A. R. Shepherd & Co	18,250
Joseph L. Savage	16,345

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*
NAVY DEPARTMENT, BUREAU OF CONSTRUCTION AND REPAIR, *May* 20, 1873.

Offers to furnish and deliver 100,000 *pounds ingot-copper* (50,000 *pounds "lake," and* 50,000 *pounds other than "lake,") at the Washington navy-yard, under advertisement of Bureau of Construction and Repair of July* 17, 1873.

D. Babcock & Co	$27,960 00
Holmes & Lissberger	27,875 00
Hyatt & Spencer	28,187 50
George H. Creed	29,400 00
Pope, Cole & Co	*27,550 00
Joseph L. Savage	28,400 00
N. L. Simpkins	28,500 00

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*
NAVY DEPARTMENT, BUREAU OF CONSTRUCTION AND REPAIR, *July* 31, 1873.

Proposals for the construction of two iron steam sloops-of-war, offered under the advertisement of the Bureau of Construction and Repair of June 18, 1873.

	Vessel complete.	Hull only.
Wm. Cramp & Sons	one $325,000	
John Roach	two *$290,000 each	
The Harlan & Hollingsworth Company	two $350,000 each	
Atlantic Works	one $305,000	one $185,000
	two for $592,000	two $362,000

*Accepted for two vessels.

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*
NAVY DEPARTMENT, BUREAU OF CONSTRUCTION AND REPAIR, *August* 1, 1873.

Proposals for the construction, including all the necessary materials except the live-oak timber, of the hull of a steam sloop-of-war of about 640 *tons, offered under the advertisement of the Bureau of Construction and Repair of June* 21, 1873.

Nathaniel McKay	$185,000
Thomas Stack	148,500
Donald McKay	168,000
Robert E. Jackson	169,950

*Accepted.

William W. Bates		$180,000
John Englis & Son		190,000
John W. Griffiths		179,400
†John W. Lynn,	(delivered at Philadelphia)	83,000
	(delivered at New York)	83,500
	(delivered at Boston)	84,000

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*
NAVY DEPARTMENT, BUREAU OF CONSTRUCTION AND REPAIR, *August* 7, 1873.

Proposals for building sloop-of-war at Kittery navy-yard, (labor only,) offered under advertisement of the Bureau of Construction and Repair of July 30, 1873.

E. K. McMichael, all except blacksmith work	$46,725
*John W. Griffiths, all except blacksmith work	46,200
Simon McKay, all except blacksmith work	52,600
William Fernald, all carpenter work	46,000
Cate & Huntress, joiner work, in and out	19,965
Levi Remick, joiner work, in and out	17,600
Joseph W. Marden, joiner work, in and out	13,340
Samuel A Tobey, joiner work, in and out	13,390
Jesse M. Wilson, calking and scraping	5,325
Green & Adams, calking and scraping	3,700
Benjamin Bailey, calking and scraping	3,800
John Remick, raising framing, ribboning, and planking	13,500
S. F. Trefethan, decking and strapping	10,800
Badger & Hunter, timbering, strapping, and planking	10,460
William W. Dixon, outboard joiner work	3,300
Samuel Clark, inboard joiner work	9,700
Berry & Jones, blacksmith work	25,645
Joseph E. Fernald, first calking	4,800

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*
NAVY DEPARTMENT, BUREAU OF CONSTRUCTION AND REPAIR, *September* 1, 1873.

Offers to furnish and deliver 50,000 *pounds of ingot-copper, other than "lake," at the Washington Navy-yard, under advertisement of Bureau of Construction and Repair of September* 4, 1873.

David Babcock & Co	$13,650 00
Pope, Cole & Co	13,250 00
Joseph L. Savage	*13,125 00

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*

NAVY DEPARTMENT, BUREAU OF CONSTRUCTION AND REPAIR, *September* 22, 1873.

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*Accepted. † Withdrew his bid.

Offers to furnish material for the navy, under the advertisement of the Bureau of Construction and Repair of April 29, 1873, at the navy-yard, Kittery, Maine.

Class No. 1. White-oak logs:‡

Samuel Richardson	$5,500 00
Thomas W. Butt	7,200 00
W. M. Shakspear	6,000 00
Trickey & Jewett	6,000 00
William White	6,600 00
S. P. Brown	7,800 00
George T. Wallace	6,550 00

Class No. 2. White-oak keel-pieces:

Thomas W. Butt	*1,144 00
W. M. Shakespear	1,235 00
Trickey & Jewett	1,300 00
William White	1,950 00
S. P. Brown	2,340 00
George T. Wallace	1,560 00

Class No. 3. White-oak curve timber:

Samuel Richardson	1,498 00
Thomas W. Butt	*1,498 00
W. M. Shakespear	1,819 00
Trickey & Jewett	1,819 00
William White	1,926 00
S. P. Brown	6,420 00
George T. Wallace	2,140 00

Class No. 7. Yellow-pine logs:

Thomas W. Butt	8,700 00
A. H. Lindsay	6,900 00
W. M. Shakespear	6,900 00
Trickey & Jewett	*6,450 00
William White	6,900 00
S. P. Brown	10,200 00
George T. Wallace	7,050 00

Class No. 9. Yellow-pine mast-timber:

A. H. Lindsay	*2,193 84
W. M. Shakespear	3,656 40
Trickey & Jewett	3,656 40
William White	2,559 48
S. P. Brown	5,789 30
George T. Wallace	2,254 78

Class No. 11. White-pine logs:

Trickey & Jewett	*2,400 00
S. P. Brown	3,800 00

Class No. 13. White-pine plank boards:

Joseph W. Duryee	940 00
Trickey & Jewett	*800 00
Watson & Pittinger	1,480 00

Class No. 15. White ash:

Joseph W. Duryee	*§385 00
Trickey & Jewett	§385 00
Watson & Pettinger	693 00

Class No. 16. White-ash oars:

George T. Vaughan	406 24
David Babcock & Co	*383 25
George H. Creed	459 90
Watson & Pettinger	2,503 90

Class No. 18. Black-walnut, &c.

Joseph W. Duryee	4,000 00
Trickey & Jewett	*2,500 00
Watson & Pettinger	5,600 00

Class No. 32. Iron, round and square:

Spalding & Parrott	790 00
Hyatt & Spencer	721 00
David Babcock & Co	873 00
George H. Creed	775 00
John Williams	*691 00
Joseph L. Savage	846 25

Class No. 33. Iron, flat:

Spalding & Parrott	1,048 00
Hyatt & Spencer	981 85
George H. Creed	1,012 50
John Williams	*931 20
Joseph L. Savage	1,172 00

Class No. 34. Iron, plate:

Hyatt & Spencer	†3,190 42
David Babcock & Co	*3,565 53
George H. Creed	3,633 26
Joseph L. Savage	3,825 74

Class No. 35. Steel:

Spalding & Parrott	52 00
Hyatt & Spencer	52 00
George H. Creed	52 00
Joseph L. Savage	46 00
Reese, Graff & Woods	*41 60

Class No. 37. Iron spikes:‡

Spalding & Parrott	325 00
Hyatt & Spencer	362 50
David Babcock & Co	350 00
George H. Creed	395 00
Joseph L. Savage	312 50

Class No. 39. Iron cut nails:

James L. Parker	*108 85
Hyatt & Spencer	†108 18
George H. Creed	132 00
Joseph L. Savage	115 07

* Accepted. † Bid rejected. ‡ Class not awarded. § Decided by lot.

Class No. 42. Lead pipe, sheet:

James L. Parker	*$594 00
Hyatt & Spencer	600 00
David Babcock & Co	625 00
George H. Creed	605 00
Joseph L. Savage	655 00

Class No. 43. Zinc:

Hyatt & Spencer	1,018 75
David Babcock & Co	997 50
George H. Creed	*920 00
Joseph L. Savage	1,085 00

Class No. 44. Tin:

James L. Parker	728 00
Hyatt & Spencer	747 60
David Babcock & Co	*724 00
George H. Creed	884 00
Joseph L. Savage	798 00

Class No. 45. Solder: ‡

James L. Parker	111 00
Hyatt & Spencer	102 00
David Babcock & Co	102 00
George H. Creed	105 00
Joseph L. Savage	96 00

Class No. 48. Locks, hinges:

James L. Parker	249 00
Hyatt & Spencer	141 62
David Babcock & Co	*138 50
George H. Creed	206 00
Joseph L. Savage	308 50

Class No. 49. Screws:

Hyatt & Spencer	†533 28
David Babcock & Co	621 21
George H. Creed	*572 40
Joseph L. Savage	689 35

Class No. 50. Files: ‡

James L. Parker	798 47
Hyatt & Spencer	563 93
George H. Creed	951 02
Joseph L. Savage	669 52

Class No. 51. Augers: ‡

Hyatt & Spencer	465 96
Joseph L. Savage	548 53

Class No. 52. Tools for stores:

Hyatt & Spencer	87 31
David Babcock & Co	*69 75
George H. Creed	112 50
Joseph L. Savage	91 00

Class No. 53. Tools for yards and shops:

Hyatt & Spencer	10,417 95
David Babcock & Co	11,548 20
George H. Creed	*9,817 30
Joseph L. Savage	11,923 10

Class No. 54. Hardware:

Hyatt & Spencer	†$627 87
David Babcock & Co	*658 40
Joseph L. Savage	913 06

Class No. 56. White-lead:

James L. Parker	*1,045 00
Hyatt & Spencer	1,112 50
David Babcock & Co	1,190 00
George H. Creed	1,125 00
Joseph L. Savage	1,250 00
Witherall & Bros	1,100 00

Class No. 58. Colored paints:

James L. Parker	*417 00
Hyatt & Spencer	†383 75
David Babcock & Co	477 95
George H. Creed	484 50
Joseph L. Savage	446 50

Class No. 59. Linseed-oil:

James L. Parker	3,500 00
Hyatt & Spencer	3,500 00
David Babcock & Co	*3,430 00
George H. Creed	3,675 00
Joseph L. Savage	3,465 00

Class No. 60. Varnish, &c.: ‡

James L. Parker	249 00
Hyatt & Spencer	222 75
David Babcock & Co	244 05
George H. Creed	251 40
Joseph L. Savage	235 45

Class No. 63. Sperm and lard oil: ‡

Hyatt & Spencer	746 00
David Babcock & Co	823 00
George H. Creed	780 00
Joseph L. Savage	753 00
Hastings & Co	958 00

Class No. 64. Tallow, soap: ‡

Geo. T. Vaughn	215 00
Henry C. Walker	220 00
Hyatt & Spencer	210 00
David Babcock & Co	215 00
George H. Creed	300 00
Joseph L. Savage	195 00

Class No. 65. Fish-oil: ‡

Geo. T. Vaughn	332 00
Hyatt & Spencer	248 00
David Babcock & Co	268 00
Geo. H. Creed	236 00
Joseph L. Savage	228 00

* Accepted. † Rejected. ‡ Class not awarded.

Class No. 69. Brushes:

James L. Parker	*$375 00
Hyatt & Spencer	441 00
Joseph L. Savage	720 62

Class No. 70. Dry-goods: ‡

Hyatt & Spencer	380 20
David Babcock & Co	426 42
George H. Creed	467 20
Joseph L. Savage	371 90

Class No. 71. Stationery:

Frost & Adams	999 35
Wm. H. Dempsey	1,182 28
Wm. Ballantyne	*978 28
P. W. Derham	1,409 55

Class No. 73. Ship-chandlery: ‡

George T. Vaughn	513 37
Hyatt & Spencer	429 80
David Babcock & Co	526 00
George H. Creed	440 00
Joseph L. Savage	377 50

Class No. 74. Acids: ‡

Hyatt & Spencer	334 40
David Babcock & Co	423 00
George H. Creed	$571 60
Joseph L. Savage	418 34

Class No. 77. Belting, packing: ‡

Hyatt & Spencer	300 00
David Babcock & Co	332 75
George H. Creed	372 50
Joseph L. Savage	329 25

Class No. 78. Leather: ‡

Hyatt & Spencer	298 50
David Babcock & Co	325 00
George H. Creed	400 50
Joseph L. Savage	291 40
William Conn	352 00

Class 87. Bituminous coal:

John W. Deering	4,782 00
Spalding & Parrott	5,220 00
Charles E. Walker & Co.	5,250 00
David Babcock & Co	5,274 00
Con. Coal Co	*4,722 00

Class No. 88. Charcoal.

Charles E. Walker & Co.	1,475 00
David Babcock & Co	*1,045 00
George H. Creed	1,450 00

* Accepted.

‡ Class not awarded.

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*

NAVY DEPARTMENT, BUREAU OF CONSTRUCTION AND REPAIR, *May* 27, 1873.

Offers to furnish materials for the Navy, under the advertisement of the Bureau of Construction and Repair, of April 29, 1873, *at the navy-yard, Charlestown, Mass.*

Class No. 1. White-oak logs: ‡

Samuel Richardson	$5,500 00
Thomas W. Butt	7,000 00
W. M. Shakespear	6,000 00
Wm. White	6,600 00
S. P. Brown	7,800 00
Trickey & Jewett	6,000 00
George T. Wallace	6,500 00

Class No. 7. Yellow-pine logs:

Thomas W. Butt	5,500 00
W. M. Shakespear	4,500 00
Wm. White	4,500 00
S. P. Brown	6,800 00
Trickey & Jewett	*4,300 00
Watson & Pittinger	4,900 00
George T. Wallace	4,600 00

Class No. 16. White-ash oars:

D. Babcock & Co	*491 16
George H. Creed	567 65

Class No. 25. Lignum-vitæ:

D. Babcock & Co	*$620 00
George H. Creed	720 00
Trickey & Jewett	650 00

Class No, 32. Iron, round and square:

May & Co	*3,784 00
Loring & Wales Brothers	4,410 00
Hyatt & Spencer	†3,755 00
John Williams	3,927 00
D. Babcock & Co	4,787 00
George H. Creed	3,985 00
Joseph L. Savage	4,835 00

Class No. 33. Iron, flat:

May & Co	1,337 00
Loring & Wales Brothers	1,796 25
Hyatt & Spencer	1,414 00
John Williams	1,372 50
D. Babcock & Co	1,692 50
George H. Creed	*1,217 00
Joseph L. Savage	1,720 00

* Accepted. † Rejected. ‡ Class not awarded.

Class No. 34. Iron plate:

May & Co	*$2,892 34
Loring & Wales Brothers	3,502 04
Hyatt & Spencer	†2,558 61
D. Babcock & Co	3,133 23
G. H. Creed	3,121 10
Joseph L. Savage	3,356 15

Class No. 35. Steel:

May & Co	*$1,743 50
Loring & Wales Brothers	2,541 00
Hyatt & Spencer	1,955 10
George H. Creed	1,826 00
Joseph L. Savage	2,114 62
Reese, Graff & Woods	1,936 00

Class No. 37. Iron spikes:

Loring & Wales Brothers	*405 00
Hyatt & Spencer	465 00
D. Babcock & Co	450 00
George H. Creed	438 75
Joseph L. Savage	429 37

Class No. 38. Iron wrought nails:‡

Loring & Wales Brothers	37 50
Hyatt & Spencer	43 50
George H. Creed	144 00
Joseph L. Savage	37 50

Class No. 39. Iron cut nails:

May & Co	627 20
Loring & Wales Brothers	645 57
Hyatt & Spencer	†574 08
D. Babcock & Co	619 60
G. H. Creed	*607 55
Joseph L. Savage	631 20

Class No. 42. Lead:

J. H. Chadwick & Co	*708 75
Hyatt & Spencer	746 25
D. Babcock & Co	763 75
George H. Creed	713 00
Joseph L. Savage	812 50

Class No. 43. Zinc:

May & Co	4,250 00
Hyatt & Spencer	4,750 00
D. Babcock & Co	4,450 00
George H. Creed	*3,800 00
Joseph L. Savage	5,062 50

Class No. 44. Tin:

May & Co	*515 00
Hyatt & Spencer	636 05
D. Babcock & Co	556 50
George H. Creed	565 00
Joseph L. Savage	611 70

Class No. 48. Locks, hinges, &c.:

May & Co	$1,242 90
Hyatt & Spencer	950 95
D. Babcock & Co	1,020 65
George H. Creed	*756 80
Joseph L. Savage	1,829 00

Class No. 49. Screws:

May & Co	50 40
Hyatt & Spencer	48 75
D. Babcock & Co	52 70
George H. Creed	*43 80
Joseph L. Savage	65 05

Class No. 50. Files:

May & Co	2,553 21
Hyatt & Spencer	2,157 85
George H. Creed	*2,063 42
Joseph L. Savage	2,661 09

Class No. 51. Augers:

Hyatt & Spencer	†2,469 15
George H. Creed	*2,741 10
Joseph L. Savage	3,014 45

Class No. 52. Tools for stores:

May & Co	908 00
Hyatt & Spencer	†551 26
D. Babcock & Co	876 50
George H. Creed	*650 00
Joseph L. Savage	703 00

Class No. 53. Tools for yard use:

May & Co	2,892 37
Hyatt & Spencer	2,687 73
D. Babcock & Co	2,986 85
George H. Creed	*2,416 93
Joseph L. Savage	3,230 70

Class No. 54. Hardware:

May & Co	3,046 09
Hyatt & Spencer	2,938 89
D. Babcock & Co	3,251 00
George H. Creed	*2,806 80
Joseph L. Savage	3,386 40

Class No. 56. White lead:

J. H. Chadwick & Co	4,100 00
D. & J. Noblit	5,200 00
Hyatt & Spencer	4,350 00
D. Babcock & Co	4,360 00
George H. Creed	*3,960 00
Joseph L. Savage	4,650 00
Witherall & Bros	4,400 00
Fahnstock & Schwartz	4,136 00

* Accepted. † Rejected. ‡ Class not awarded.

Class No. 57. Zinc:

Hyatt & Spencer	$456 25
D. Babcock & Co	§450 00
George H. Creed	*§450 00
Joseph L. Savage	468 75

Class No. 58. Colored paints:

Charles Richardson & Co	1,139 00
May & Co	*1,033 00
Hyatt & Spencer	1,070 10
D. Babcock & Co	1,083 00
George H. Creed	1,121 00
Joseph L. Savage	1,100 30

Class No. 60. Varnish, &c.:

Charles Richardson & Co	2,491 00
May & Co	2,348 50
Hyatt & Spencer	2,344 50
D. Babcock & Co	2,312 00
George H. Creed	*2,134 50
Joseph L. Savage	2,418 80

Class No. 63. Sperm and lard oil:

D. & J. Noblit	6,015 00
Thomas G. Hunt	6,000 00
Hyatt & Spencer	5,220 00
D. Babcock & Co	5,280 00
George H. Creed	*4,710 00
Joseph L. Savage	4,938 00
Hastings & Co	6,654 00

Class No. 64. Tallow, soap:‡

D. & J. Noblit	60 00
Hyatt & Spencer	33 75
D. Babcock & Co	50 00
George H. Creed	45 00
Joseph L. Savage	29 37

Class No. 65. Fish-oil:‡

D. & J. Noblit	1,290 00
Thomas G. Hunt	1,125 00
Hyatt & Spencer	900 00
D. Babcock & Co	960 00
George H. Creed	900 00
Joseph L. Savage	855 00

Class No. 68. Glass:

May & Co	*528 92
Hyatt & Spencer	559 58
D. Babcock & Co	704 95
George H. Creed	617 43
Joseph L. Savage	782 94

Class No. 69. Brushes:

May & Co	1,324 50
Hyatt & Spencer	1,254 74
D. Babcock & Co	1,398 95
George H. Creed	*1,212 75
Joseph L. Savage	1,469 15

Class No. 70. Dry-goods:

Hyatt & Spencer	$933 35
D. Babcock & Co	991 25
George H. Creed	*844 75

Class No. 71. Stationery:

John M. Whittemore & Co	1,126 72
W. H. Dempsey	1,149 41
Frost & Adams	1,122 75
Wm. Ballantyne	*1,120 62
P. W. Derham	1,290 15

Class No. 72. Crucibles:

May & Co	*361 05
Hyatt & Spencer	362 64
D. Babcock & Co	405 00
George H. Creed	416 00
Joseph L. Savage	374 00

Class No. 73. Ship-chandlery:

Hyatt & Spencer	1,400 75
D. Babcock & Co	1,537 50
George H. Creed	*990 50

Class No. 74. Acids:

Hyatt & Spencer	5,138 96
D. Babcock & Co	1,995 45
George H. Creed	*1,280 75
Joseph L. Savage	1,569 60

Class No. 75. Resin, pitch, &c.:

Hyatt & Spencer	237 50
D. Babcock & Co	235 00
George H. Creed	*224 50

Class No. 77. Belting, packing:‡

C. M. Clapp & Co	5,186 00
Hyatt & Spencer	4,347 30
D. Babcock & Co	5,575 75
George H. Creed	3,939 75
Joseph L. Savage	4,946 70
Pine & Barnum	5,332 75
Boston Car-Spring Co§	

Class No. 78. Leather:

C. M. Clapp & Co	*874 50
May & Co	887 00
Hyatt & Spencer	1,056 00
D. Babcock & Co	1,213 60
George H. Creed	876 00
Joseph L. Savage	1,148 50
Pine & Barnum	§600 00
William Conn	1,677 00

Class No. 85. Anthracite coal:

J. C. Wellington	16,200 00
D. Babcock & Co	*16,040 00
S. P. Brown	20,400 00

* Accepted. † Rejected. ‡ Class not awarded. § Decided by lot.

Class No. 87. Bituminous coal:

J. C. Wellington	$6,760 00
Con. Coal Co	6,136 00
Alex. Ray, agent	*6,080 00
D. Babcock & Co	6,912 00

Opened in presence of—

I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*

NAVY DEPARTMENT, BUREAU OF CONSTRUCTION AND REPAIR, *May* 27, 1873.

Offers to furnish material for the Navy under the advertisement af the Bureau of Construction and Repair, of April 29, 1873, *at the navy-yard, Brooklyn, N. Y.*

Class No 1. White-oak logs: ‡

Samuel Richardson	$10,000 00
Thomas W. Butt	13,400 00
A. H. Lindsay	13,000 00
Wm. M. Shakespear	11,000 00
S. P. Brown	13,800 00
Trickey & Jewett	11,000 00
Wm. White	12,400 00
George T. Wallace	12,800 00
J. Bigler & Co	11,800 00

Class No. 7. Yellow-pine logs:

Thomas W. Butt	10,400 00
A. H. Lindsay	9,000 00
Wm. M. Shakespear	9,000 00
S. P. Brown	12,600 00
Trickey & Jewett	*8,200 00
Wm. White	8,400 00
Watson & Pittinger	8,800 00
Geo. T. Wallace	9,000 00
J. Bigler & Co	8,600 00

Class No. 13. White-pine plank boards:

Joseph W. Duryee	10,585 00
S. P. Brown	13,990 00
Trickey & Jewett	*9,825 00
Watson & Pittinger	10,200 00
J. Bigler & Co	11,558 00

Class No. 15. White ash, &c.:

Joseph W. Duryee	*1,950 00
A. H. Lindsay	2,000 00
Trickey & Jewett	2,100 00
Watson & Pittinger	2,125 00

Class No. 16. White-ash oars:

G. H. Creed	760 00
D. Babcock & Co	*670 00
Watson & Pittinger	2,900 00

Class No. 88. Charcoal:

D. Babcock & Co	$1,875 00
George H. Creed	*1,580 00

Class No. 18. Black walnut, &c.:

Joseph W. Duryee	$935 00
Trickey & Jewett	975 00
Watson & Pittinger	*927 00

Class No. 23. Black spruce:

S. P. Brown	1,600 00
Trickey & Jewett	1,600 00
Watson & Pittinger	*1,460 00
Joseph Wescott	§ 1,100 00

Class No. 24. White-oak staves, &c.:

Thomas W. Butt	2,600 00
D. Babcock & Co	2,800 00
Watson & Pittinger	*2,510 00

Class No. 32. Iron, round and square:

Hyatt & Spencer	7,585 00
John Williams	7,939 00
George H. Creed	*7,462 50
D. Babcock & Co	9,660 00
Joseph L. Savage	8,750 00

Class No. 33. Iron, flat:

Hyatt & Spencer	†1,526 00
John Williams	*1,553 00
George H. Creed	1,615 00
D. Babcock & Co	1,884 50
Joseph L. Savage	1,780 00

Class No. 37. Iron spikes:

D. & J. Noblit	2,520 00
Hyatt & Spencer	2,038 75
George H. Creed	*1,890 00
D. Babcock & Co	2,100 00
Joseph L. Savage	1,965 00

*Accepted. †Rejected. ‡Class not awarded §Received too late.

Class No. 38. Iron, wrought, nails:‡

Hyatt & Spencer	$61 50
George H. Creed	195 00
Joseph L. Savage	61 50

Class No. 39. Iron cut nails:

Hyatt & Spencer	165 37
George H. Creed	*158 50
D. Babcock & Co	180 00
Joseph L. Savage	176 00

Class No. 42. Lead, pipe, sheet:

Hyatt & Spencer	1,592 00
George H. Creed	*1,471 00
D. Babcock & Co	1,632 00
Joseph L Savage	1,692 50

Class No. 43. Zinc:

Hyatt & Spencer	1,900 00
George H. Creed	*1,480 00
D. Babcock & Co	1,780 00
Joseph L. Savage	1,980 00

Class No. 44. Tin:

Hyatt & Spencer	330 80
George H. Creed	344 00
D. Babcock & Co	*302 25
Joseph L. Savage	341 75

Class No. 48. Locks, hinges, &c.:

Hyatt & Spencer	1,667 51
George H. Creed	*1,304 20
D. Babcock & Co	2,023 60
Joseph L. Savage	2,496 50

Class No. 49. Screws:

Hyatt & Spencer	1,455 10
George H. Creed	*1,388 60
D. Babcock & Co	1,502 20
Joseph L. Savage	1,880 55

Class No. 50. Files:

Hyatt & Spencer	952 11
George H. Creed	*903 50
Joseph L. Savage	1,140 14

Class No. 51. Augers:

Hyatt & Spencer	†1,749 65
George H. Creed	*1,892 85
Joseph L. Savage	2,361 40

Class No. 52. Tools for stores:

Hyatt & Spencer	88 32
George H. Creed	85 20
D. Babcock & Co	*70 80
Joseph L. Savage	130 56

Class No. 53. Tools for yards:

Hyatt & Spencer	†$758 16
George H. Creed	815 20
D. Babcock & Co	*791 36
Joseph L. Savage	1,095 34

Class No. 54. Hardware:

Hyatt & Spencer	1,684 08
George H. Creed	*1,663 80
D. Babcock & Co	1,805 60
Joseph L. Savage	2,013 10

Class No. 56. White lead:

Hyatt & Spencer	2,225 00
George H. Creed	*1,980 00
D. Babcock & Co	2,180 00
Joseph L. Savage	2,125 00
Witherall & Bros	2,200 00
Fahnestock & Co	2,056 00

Class No. 57. Zinc-paint:

Hyatt & Spencer	720 00
George H. Creed	*640 00
D. Babcock & Co	760 00
Joseph L. Savage	710 00

Class No. 58. Colored paints:

Hyatt & Spencer	1,570 60
George H. Creed	*1,333 40
D. Babcock & Co	1,690 40
Joseph L. Savage	1,559 90

Class No. 59. Linseed-oil:

D. & J. Noblit	7,560 00
Hyatt & Spencer	6,930 00
George H. Creed	*6,230 00
D. Babcock & Co	6,720 00
Joseph L. Savage	6,790 00

Class No. 60. Varnish, &c.:

D. & J. Noblit	1,304 00
Hyatt & Spencer	1,104 00
George H. Creed	*1,103 00
D. Babcock & Co	1,186 00
Joseph L. Savage	1,146 00

Class No. 63. Sperm-oil:‡

Thomas G. Hunt	2,400 00
D. & J. Noblit	2,292 00
Hyatt & Spencer	1,998 00
George H. Creed	1,908 00
D. Babcock & Co	2,040 00
Joseph L. Savage	1,884 00
Hastings & Co	2,520 00

Class No. 64. Tallow, soap:

D. & J. Noblit	164 50
Hyatt & Spencer	128 00
George H. Creed	*128 00
D. Babcock & Co	136 00
Joseph L. Savage	128 50

*Accepted. †Bid rejected. ‡Class not awarded.

Class No. 65. Fish-oil:

Thomas G. Hunt	$150 00
D. & J. Noblit	170 00
Hyatt & Spencer	119 00
George H. Creed	114 00
D. Babcock & Co	132 00
Joseph L. Savage	114 00

Class No. 68. Glass:

Hyatt & Spencer	226 77
George H. Creed	235 75
D. Babcock & Co	281 75
Joseph L. Savage	312 15

Class No. 69. Brushes:

Hyatt & Spencer	†719 40
George H. Creed	*752 50
D. Babcock & Co	829 00
Joseph L. Savage	1,402 15

Class No. 70. Dry-goods:

Hyatt & Spencer	799 60
George H. Creed	*733 00
D. Babcock & Co	823 65

Class No. 71. Stationery:

W. H. Dempsey	*373 20
William Ballantyne	380 35
P. W. Derham	431 05

Class No. 73. Ship-chandlery:

Hyatt & Spencer	1,064 14
George H. Creed	*975 90
D. Babcock & Co	1,147 70

Class No. 74. Acids:

Hyatt & Spencer	†110 00
George H. Creed	*116 00
D. Babcock & Co	$151 50
Joseph L. Savage	118 50

Class No. 77. Belting, packing:‡

Hyatt & Spencer	1,366 00
George H. Creed	1,114 50
D. Babcock & Co	1,687 50
Joseph L. Savage	1,575 00
Pine & Barnum	2,056 00

Class No. 78. Leather:

Hyatt & Spencer	†198 88
George H. Creed	223 60
D. Babcock & Co	*217 80
Joseph L. Savage	226 50
Pine & Barnum	226 00
William Conn	250 00

Class No. 80. Junk:‡

George H. Creed	6,700 00
D. Babcock & Co	6,700 00
Joseph L. Savage	6,350 00

Class No. 85. Anthracite coal:

A. F. Nathan	*6,666 00
D. Babcock & Co	7,420 00

Class No. 86. Semi-bituminous coal:•

A. F. Nathan	3,852 00
D. Babcock & Co	4,080 00
Berwind & Bradley	*3,840 00

Class No. 88. Charcoal:

D. Babcock & Co	*1,220 00

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*
NAVY DEPARTMENT, BUREAU OF CONSTRUCTION AND REPAIR, *May* 27, 1873.

Offers to furnish materials for the Navy, under the advertisement of the Bureau of Construction and Repair of April 29, 1873, *at the navy-yard, Philadelphia, Pa.*

Class No. 1. White-oak logs:‡

Samuel Richardson	$4,500 00
J. & C. Stockham	5,400 00
A. H. Lindsay	6,300 00
W. M. Shakespear	4,700 00
Trickey & Jewett	7,000 00
William White	6,200 00
S. P. Brown	7,400 00
Watson & Pittinger	6,900 00
George T. Wallace	5,975 00
J. Bigler & Co	6,250 00

Class No. 3. White-oak curve timber:

A. H. Lindsay	$564 75
W. M. Shakespear	*481 92
Trickey & Jewett	753 00
William White	602 40
S. P. Brown	2,259 00
George T. Wallace	677 70

Class No. 4. White-oak plank:

W. M. Shakespear	*4,320 00

*Accepted. †Rejected. ‡Class not awarded.

Trickey & Jewett	$6,450 00
S. P. Brown	8,440 00
Watson & Pittinger	5,670 00
George T. Wallace	5,400 00
J. Bigler & Co	6,727 50

Class No. 11. White-pine logs:

J. & C. Stockham	*1,360 00
Trickey & Jewett	1,400 00
Watson & Pittinger	1,720 00
J. Bigler & Co	1,600 00

Class No. 13. White-pine plank, &c.:

J. W. Gaskill & Sons	*7,398 00
Joseph W. Duryee	8,341 00
Trickey & Jewett	9,635 00
S. P. Brown	11,620 00
Watson & Pittinger	7,705 00

Class No. 15. White ash, &c.: ‡

J. W. Gaskill & Sons	2,032 50
A. H. Lindsay	1,412 50
Trickey & Jewett	1,590 00
S. P. Brown	1,585 00
Watson & Pittinger	2,018 00

Class No. 18. Black walnut, &c.:

J. W. Gaskill & Sons	*260 00
Joseph W. Duryee	278 00
Trickey & Jewett	300 00
Watson & Pittinger	310 00

Class No. 32. Iron, round and square:

Paul J. Field	3,937 50
Hyatt & Spencer	3,567 00
George H. Creed	*3,538 00
D. Babcock & Co	4,548 30
John Williams	3,720 20
Joseph L. Savage	4,115 00
J. B. Shannon & Co	3,653 70

Class No. 33. Iron, flat:

Paul J. Field	1,115 00
Hyatt & Spencer	988 20
George H. Creed	1,043 00
D. Babcock & Co	1,224 20
John Williams	*1,008 20
Joseph L. Savage	1,214 50
J. B. Shannon & Co	1,132 50

Class No. 34. Iron plate: ‡

Paul J. Field	488 50
Hyatt & Spencer	422 25
George H. Creed	442 00
D. Babcock & Co	435 00
Joseph L. Savage	430 50
J. B. Shannon & Co	451 10

Class No. 37. Iron spikes: ‡

Paul J. Field	$1,607 50
Hyatt & Spencer	1,531 75
George H. Creed	1,455 00
D. Babcock & Co	1,575 00
D. & J. Noblit	1,570 00
Joseph L. Savage	1,320 00
J. B. Shannon & Co	1,175 00

Class No. 38. Iron wro't nails: ‡

Paul J. Field	119 00
Hyatt & Spencer	89 50
George H. Creed	288 00
Joseph L. Savage	99 00
J. B. Shannon & Co	247 00

Class No. 39. Iron cut nails:

Paul J. Field	490 55
Hyatt & Spencer	†454 30
George H. Creed	*462 25
Joseph L. Savage	520 65
J. B. Shannon & Co	460 75

Class No. 43. Zinc:

Hyatt & Spencer	1,233 75
George H. Creed	*1,042 00
D. Babcock & Co	1,255 00
Joseph L. Savage	1,350 00
J. B. Shannon & Co	§1,495 00

Class No. 44. Tin:

Hyatt & Spencer	780 00
George H. Creed	*760 00
D. Babcock & Co	795 00
Joseph L. Savage	820 00
J. B. Shannon & Co	820 00

Class No. 48. Locks, hinges, &c:

Paul J. Field	1,123 25
Hyatt & Spencer	816 86
George H. Creed	*684 95
D. Babcock & Co	949 60
Joseph L. Savage	928 00
J. B. Shannon & Co	1,241 35

Class No. 49. Screws:

Hyatt & Spencer	1,294 30
George H. Creed	*1,249 90
D. Babcock & Co	1,468 25
Joseph L. Savage	1,647 05
J. B. Shannon & Co	1,289 85

Class No. 50. Files:

Paul J. Field	1,292 18
Hyatt & Spencer	1,026 25
George H. Creed	*1,023 49
Joseph L. Savage	1,225 21
J. B. Shannon & Co	1,284 55

*Accepted. †Rejected. ‡Class not awarded. §Received too late.

Class No. 51. Augers:

Paul J. Field	*$1,050 30
Hyatt & Spencer	†841 39
George H. Creed	1,112 00
Joseph L. Savage	1,140 63
J. B. Shannon & Co	1,089 31

Class No. 53. Tools for yards, &c:

Paul J. Field	9,437 99
Hyatt & Spencer	†6,484 79
George H. Creed	*6,514 64
Joseph L. Savage	9,706 40
J. B. Shannon & Co	8,718 97

Class No. 54. Hardware:

Paul J. Field	1,164 84
Hyatt & Spencer	†923 40
George H. Creed	*1,020 90
Joseph L. Savage	1,157 92
J. B. Shannon & Co	1,122 91

Class No. 56. White lead:

Hyatt & Spencer	1,668 75
George H. Creed	1,635 40
D. Babcock & Co	1,687 50
D. & J. Noblit	1,800 00
Joseph L. Savage	1,668 75
Witherall & Bros	1,650 00
Fahnestock & Co	*1,533 00

Class No. 57. Zinc paint:

Hyatt & Spencer	185 00
George H. Creed	*178 00
D. Babcock & Co	200 00
Joseph L. Savage	182 50

Class No. 58. Colored paints:‡

Hyatt & Spencer	527 62
George H. Creed	580 80
D. Babcock & Co	608 08
Joseph L. Savage	538 60

Class No. 59. Linseed-oil:

Hyatt & Spencer	990 00
George H. Creed	980 00
D. Babcock & Co	*970 00
D. & J. Noblit	1,080 00
Joseph L. Savage	1,030 00

Class No. 60. Varnish, &c:

Hyatt & Spencer	†740 00
George H. Creed	*780 00
D. Babcock & Co	835 00
D. & J. Noblit	901 50
Joseph L. Savage	825 00

Class No. 63. Sperm and lard oil:

Hyatt & Spencer	†339 00
George H. Creed	*343 40
D. Babcock & Co	$365 00
D. & J. Noblit	386 00
Joseph L. Savage	349 00
Hastings & Co	420 00

Class No. 64. Tallow, soap:‡

Hyatt & Spencer	29 00
George H. Creed	32 50
D. Babcock & Co	37 00
Joseph L. Savage	25 00
J. B. Shannon & Co	32 25

Class No. 65. Fish-oil:

Hyatt & Spencer	120 00
George H. Creed	*114 00
D. Babcock & Co	136 00
D. & J. Noblit	170 00
Joseph L. Savage	120 00

Class No. 68. Glass:

Hyatt & Spencer	†611 50
George H. Creed	*643 50
Joseph L. Savage	766 50

Class No. 69. Brushes:

Paul J. Field	900 55
Hyatt & Spencer	†530 45
George H. Creed	*547 50
D. Babcock & Co	701 70
Joseph L. Savage	987 73

Class No. 70. Dry-goods:

Hyatt & Spencer	†481 51
George H. Creed	*564 95
D. Babcock & Co	614 70

Class No. 71. Stationery:

W. H. Dempsey	*453 68
Ferd. Foster	470 48
William Ballantyne	475 73

Class No. 73. Ship-chandlery:

Paul J. Field	568 00
Hyatt & Spencer	†430 00
George H. Creed	*436 50
D. Babcock & Co	554 50
J. B. Shannon & Co	538 08

Class No. 74. Acids:‡

Hyatt & Spencer	106 27
George H. Creed	125 00
D. Babcock & Co	185 00
D. & J. Noblit	135 00
Joseph L. Savage	101 25

Class No. 77. Belting, packing:‡

Paul J. Field	4,411 20
Hyatt & Spencer	978 41
D. Babcock & Co	1,929 50
Joseph L. Savage	730 64

*Accepted, † Rejected. ‡ Class not awarded.

Class No. 78. Leather:	
Hyatt & Spencer	†$33 00
D. Babcock & Co	*52 40
Joseph L. Savage	2,294 80
William Conn	53 50
Class No. 85. Anthracite coal:	
Plaisted & McCollin	*1,891 25
Class No. 86. Semi-bituminous coal:	
Plaisted & McCollin	611 00
Berwind & Bradley	*540 00
Class No. 87. Bituminous coal:	
Consolidation Coal Company	$1,230 44
Plaisted & McCollin	1,246 00
Berwind & Bradley	*1,100 00
Class No. 88. Charcoal:	
Paul J. Field	*435 00
D. Babcock & Co	550 00
John W. Hampton	456 00

Opened in presence of—

I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*

NAVY DEPARTMENT, BUREAU OF CONSTRUCTION AND REPAIR, *May* 27, 1873.

Offers to furnish material for the Navy under the advertisement of the Bureau of Construction and Repair of April 29, 1873, at the navy-yard, Washington, D. C.

Class No. 1. White-oak logs:‡	
S. P. Brown	$3,350 00
Trickey & Jewett	3,000 00
William White	3,000 00
Samuel Richardson	2,000 00
A. H. Lindsay	3,000 00
W. M. Shakespear	2,400 00
William D. Wise	2,250 00
George T. Wallace	2,900 00
Class No. 3. White-oak curved timber:	
S. P. Brown	1,500 00
Trickey & Jewett	500 00
William White	400 00
Samuel Richardson	275 00
A. H. Lindsay	360 00
W. M. Shakespear	320 00
William D. Wise	*255 00
George T. Wallace	490 00
Class No. 4. White-oak plank:	
S. P. Brown	2,015 00
Trickey & Jewett	1,875 00
William D. Wise	*1,125 00
Watson & Pittinger	1,625 00
Class No. 7. Yellow-pine logs:	
S. P. Brown	2,400 00
Trickey & Jewett	1,800 00
William White	1,600 00
A. H. Lindsay	1,760 00
W. M. Shakespear	1,760 00
Watson & Pittinger	1,800 00
George T. Wallace	*1,560 00
James Bigler & Co	1,740 00
Class No. 12. White-pine mast-timber:	
S. P. Brown	$2,900 00
William White	*1,028 00
Watson & Pittinger	1,090 00
Class No. 13. White-pine plank, boards:‡	
S. P. Brown	14,165 00
Trickey & Jewett	11,800 00
Joseph W. Duryee	10,278 50
J. W. Gaskill & Sons	9,394 00
Watson & Pittinger	10,191 00
George T. Wallace	10,952 25
Class No. 15. White ash, &c.:‡	
S. P. Brown	1,575 00
Trickey & Jewett	1,420 00
Joseph W. Duryee	1,612 50
William White	2,000 00
J. W. Gaskill & Sons	1,377 00
A. H. Lindsay	1,250 00
Watson & Pittinger	1,625 00
Class No. 18. Black walnut, &c.:	
S. P. Brown	5,528 00
Trickey & Jewett	4,520 00
Joseph W. Duryee	*4,224 00
J. W. Gaskill & Sons	4,231 00
Watson & Pittinger	4,320 00
George T. Wallace	4,848 00
Class No. 23. Black spruce:‡	
S. P. Brown	522 00
Trickey & Jewett	855 00

* Accepted. † Rejected. ‡ Class not awarded.

Watson & Pittinger	$710 00
Joseph Wescott	631 00
Class No. 32. Iron, round and square:	
Joseph L. Savage	2,908 66
David Babcock & Co	3,223 81
George H. Creed	*2,506 14
Hyatt & Spencer	2,657 37
John Williams	2,541 46
Class No. 33. Iron, flat:	
Joseph L. Savage	774 00
David Babcock & Co	860 40
George H. Creed	736 00
Hyatt & Spencer	713 10
John Williams	*677 30
Class No. 34. Iron plate:‡	
Joseph L. Savage	124 00
David Babcock & Co	172 00
George H. Creed	144 00
Hyatt & Spencer	152 80
Class No. 35. Steel:‡	
Joseph L. Savage	.819 25
George H. Creed	878 50
Hyatt & Spencer	907 25
Reese, Graff & Woods	892 00
Class No. 37. Iron spikes:‡	
Joseph L. Savage	586 50
David Babcock & Co	746 00
George H. Creed	704 25
Hyatt & Spencer	741 25
Class No. 38. Iron wrought nails:‡	
Joseph L. Savage	87 00
George H. Creed	108 00
Hyatt & Spencer	85 50
Class No. 39. Iron cut nails:‡	
Joseph L. Savage	911 00
David Babcock & Co	1,072 00
George H. Creed	936 20
Hyatt & Spencer	896 12
Class No. 42. Lead, pipe, sheet:	
Joseph L. Savage	596 00
David Babcock & Co	574 00
George H. Creed	*557 00
Hyatt & Spencer	560 00
Class No. 43. Zinc:‡	
Joseph L. Savage	57 50
David Babcock & Co	57 50
George H. Creed	65 00
Hyatt & Spencer	55 00
Class No. 44. Tin:	
Joseph L. Savage	$1,440 00
David Babcock & Co	1,492 85
George H. Creed	*1,340 00
Hyatt & Spencer	1,489 40
Class No. 45. Solder:‡	
Joseph L. Savage	96 00
David Babcock & Co	103 50
George H. Creed	105 00
Hyatt & Spencer	102 00
Class No. 48. Locks, hinges, &c.:‡	
Joseph L. Savage	609 00
David Babcock & Co	809 50
George H. Creed	686 50
Hyatt & Spencer	702 25
Class No. 49. Screws of brass and iron:	
Joseph L. Savage	553 34
David Babcock & Co	616 91
George H. Creed	*516 10
Hyatt & Spencer	520 48
Class No. 50. Files:	
Joseph L. Savage	734 68
George H. Creed	*651 14
Hyatt & Spencer	†630 24
Class No. 51. Augers:‡	
Joseph L. Savage	66 48
George H. Creed	68 30
Hyatt & Spencer	341 60
Class No. 53. Tools for yard use:	
Joseph L. Savage	261 10
David Babcock & Co	*197 27
George H. Creed	271 43
Hyatt & Spencer	234 19
Class No. 54. Hardware:	
Joseph L. Savage	2,383 10
David Babcock & Co	2,520 44
George H. Creed	*2,188 30
Hyatt & Spencer	2,428 06
Class No. 58. Colored paints, driers:	
Joseph L. Savage	36 50
David Babcock & Co	35 90
George H. Creed	*35 25
Hyatt & Spencer	†32 50
Class No. 59. Linseed-oil:‡	
Joseph L. Savage	472 50
David Babcock & Co	490 00

* Accepted. † Rejected. ‡ Class not awarded.

George H. Creed	$485 00
Hyatt & Spencer	497 50
D. & J. Noblit	540 00

Class No. 60. Varnish, spirits turpentine:

Joseph L. Savage	411 25
David Babcock & Co	417 75
George H. Creed	*395 75
Hyatt & Spencer	†354 25
D. & J. Noblit	§339 25

Class No. 63. Sperm and lard oil:

Joseph L. Savage	713 00
David Babcock & Co	767 00
George H. Creed	*700 00
Hyatt & Spencer	†678 75
D. & J. Noblit	837 50
Hastings & Co	938 00

Class No. 68. Glass:‡

Joseph L. Savage	480 00
David Babcock & Co	540 00
George H. Creed	540 00
Hyatt & Spencer	700 00

Class No. 69. Brushes:

Joseph L. Savage	177 00
David Babcock & Co	*166 87
George H. Creed	189 50
Hyatt & Spencer	181 63

Class No. 70. Dry-goods:†

Joseph L. Savage	207 90
David Babcock & Co	268 30
George H. Creed	265 96
Hyatt & Spencer	235 86

Class No. 71. Stationery:

William Ballantyne	*151 86
W. H. Dempsey	192 40
Warren Choate & Co	154 81

Class No. 73. Ship-chandlery:†

Joseph L. Savage	845 86
David Babcock & Co	961 85
George H. Creed	$891 47
Hyatt & Spencer	901 45

Class No. 74. Acids:‡

Joseph L. Savage	24 75
David Babcock & Co	42 00
George H. Creed	31 50
Hyatt & Spencer	20 25

Class No. 77. Belting, packing:‡

Joseph L. Savage	793 68
David Babcock & Co	705 68
George H. Creed	720 51
Hyatt & Spencer	621 02
Pine & Barnum	676 70

Class No. 78. Leather:‡

Joseph L. Savage	280 40
David Babcock & Co	340 20
George H. Creed	323 60
Hyatt & Spencer	299 40
William Conn	426 40

Class No. 85. Anthracite coal:‡

S. P. Brown	450 00

Class No. 87. Bituminous coal:

David Babcock & Co	11,487 00
Alexander Ray, agent	10,542 00
Consolidation Coal Company	*9,639 00

Class No. 88. Charcoal:

David Babcock & Co	1,250 00
Joseph L. Savage	550 00
John L. Moore	*450 00
William T. Clark	500 00

Class No. 89. Wood:‡

Joseph L. Savage	496 00
David Babcock & Co	640 00

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*

NAVY DEPARTMENT, BUREAU OF CONSTRUCTION AND REPAIR, *May* 27, 1873.

Offers to furnish material for the Navy under advertisement of the Bureau of Construction and Repair of April 29, 1873, at the navy-yard, Norfolk, Va.

Class No. 1. White-oak logs:‡

Samuel Richardson	$16,666 66
Thomas W. Butt	23,500 00
A. H. Lindsay	25,000 00
W. M. Shakespear	22,500 00
Trickey & Jewett	$28,000 00
William White	22,250 00
S. P. Brown	37,000 00
Watson & Pittinger	34,500 00
George T. Wallace	24,500 00
J. Bigler & Co	37,250 00

*Accepted. †Rejected. ‡Class not awarded. §Informal.

Class No. 2. White-oak keels:

Samuel Richardson	$1,006 40
Thomas W. Butt	*855 44
W. M. Shakespear	943 50
Trickey & Jewett	1,258 00
William White	1,258 00
S. P. Brown	2,138 60
Watson & Pittinger	2,503 42
George T. Wallace	1,006 40

Class No. 3. White-oak curved timber:

Samuel Richardson	2,146 00
Thomas W. Butt	*2,035 00
W. M. Shakespear	2,368 00
Trickey & Jewett	2,775 00
William White	2,220 00
S. P. Brown	9,250 00
Watson & Pittinger	7,363 00
George T. Wallace	3,182 00

Class No. 8, Yellow-pine beams:

Thomas W. Butt	*2,394 45
A. H. Lindsay	2,580 68
W. M. Shakespear	3,990 75
Trickey & Jewett	3,724 70
William White	2,660 50
S. P. Brown	6,385 20
Watson & Pittinger	4,256 80
George T. Wallace	3,192 60

Class No. 9. Yellow-pine masts:‡

Thomas W. Butt	1,106 30
A. H. Lindsay	1,042 48
W. M. Shakespear	851 00
Trickey & Jewett	1,702 00
William White	1,063 75
S. P. Brown	2,553 00
Watson & Pittinger	1,684 98
George T. Wallace	1,276 50

Class No. 12. White-pine masts:

Trickey & Jewett	805 00
William White	644 00
S. P. Brown	3,864 00
Watson & Pittinger	*611 80

Class No. 13. White-pine plank, &c.:

J. W. Gaskill & Sons	*2,512 00
Joseph W. Duryee	2,695 00
Trickey & Jewett	3,410 00
S. P. Brown	2,695 00
Watson & Pittinger	2,570 00

Class No. 15. White ash, &c.:‡

J. W. Gaskill & Sons	717 50
Joseph W. Duryee	774 00
A. H. Lindsay	$480 00
Trickey & Jewett	782 50
William White	960 00
Watson & Pittinger	820 00

Class No. 16. White-ash oars:

D. Babcock & Co	*198 00
George H. Creed	202 50
Watson & Pittinger	450 00

Class No. 18. Black walnut, &c.:

J. W. Gaskill & Sons	1,159 00
Joseph W. Duryee	1,167 50
Trickey & Jewett	1,240 00
William White	1,488 00
S. P. Brown	1,492 50
Watson & Pittinger	*1,140 00

Class No. 19. Locust timber:‡

Samuel Richardson	600 00
Thomas W. Butt	750 00
Trickey & Jewett	2,000 00
William White	1,300 00
S. P. Brown	4,000 00
Watson & Pittinger	2,000 00
George T. Wallace	1,350 00

Class No. 20. Locust tree-nails:‡

Samuel Richardson	575 00
Thomas W. Butt	725 00
A. H. Lindsay	625 00
Trickey & Jewett	800 00
William White	900 00
D. Babcock & Co	2,615 00
Watson & Pittinger	1,980 00

Class No. 23. Black spruce:‡

Trickey & Jewett	2,380 00
William White	1,960 00
S. P. Brown	1,140 00
Watson & Pittinger	1,560 00
Joseph Wescott	1,380 00

Class No. 24. White oak staves, &c.:‡

Thomas W. Butt	550 00
A. H. Lindsay	47 50
D. Babcock & Co	1,080 00
Lookin & Myers	600 00
Watson & Pittinger	1,180 00

Class No. 32. Iron, round and square:

Hyatt & Spencer	4,231 80
D. Babcock & Co	5,187 25
George H. Creed	4,219 25
Joseph L. Savage	5,216 00
John Williams	*4,124 00

* Accepted.

‡ Class not awarded.

Class No. 33. Iron, flat:

Hyatt & Spencer	$868 70
D. Babcock & Co	1,069 00
George H. Creed	932 00
Joseph L. Savage	1,069 00
John Williams	*868 00

Class No. 34. Iron, plate:

Hyatt & Spencer	711 00
Taylor, Martin & Co	770 00
D. Babcock & Co	694 50
George H. Creed	*676 00
Joseph L. Savage	685 00

Class No. 35. Steel:

Hyatt & Spencer	1,362 00
Taylor, Martin & Co	1,624 50
George H. Creed	*1,306 00
Joseph L. Savage	1,428 00
Reese, Graff & Woods	1,376 00

Class No. 37. Iron spikes:‡

Hyatt & Spencer	381 00
Taylor, Martin & Co	400 00
D. Babcock & Co	411 25
George H. Creed	400 00
Joseph L. Savage	327 50

Class No. 38. Iron wrought nails:

Hyatt & Spencer	†102 25
Taylor, Martin & Co	112 50
George H. Creed	*105 00
Joseph L. Savage	105 50

Class No. 39. Iron cut nails:

Hyatt & Spencer	†554 40
Taylor, Martin & Co	*559 20
D. Babcock & Co	704 05
George H. Creed	604 50
Joseph L. Savage	730 25

Class No. 42. Lead, pipe, sheet:

Hyatt & Spencer	†650 00
Taylor, Martin & Co	707 50
D. Babcock & Co	707 50
George H. Creed	*664 00
Joseph L. Savage	727 50

Class No. 43. Zinc:

Hyatt & Spencer	2,887 50
Taylor, Martin & Co	2,850 00
D. Babcock & Co	2,820 00
George H. Creed	*2,520 00
Joseph L. Savage	3,187 50

Class No. 44. Tin:

Hyatt & Spencer	1,350 00
Taylor, Martin & Co	1,350 00
D. Babcock & Co	$1,365 00
George H. Creed	*1,290 00
Joseph L. Savage	1,380 00

Class No. 45. Solder:

Hyatt & Spencer	†102 00
Taylor, Martin & Co	120 00
D. Babcock & Co	§105 00
George H. Creed	*§105 00
Joseph L. Savage	111 00

Class No. 48. Locks, hinges, &c.:

Hyatt & Spencer	248 73
Taylor, Martin & Co	279 30
D. Babcock & Co	259 47
George H. Creed	*234 00
Joseph L. Savage	357 50

Class No. 49. Screws:

Hyatt & Spencer	†249 72
Taylor, Martin & Co	*276 21
D. Babcock & Co	282 40
George H. Creed	302 07
Joseph L. Savage	327 62

Class No. 50. Files:‡

Hyatt & Spencer	151 86
Taylor, Martin & Co	180 30
George H. Creed	182 78
Joseph L. Savage	175 32

Class No. 52. Tools for ships' stores:

Hyatt & Spencer	†270 50
Taylor, Martin & Co	341 25
D. Babcock & Co	315 34
George H. Creed	*295 50
Joseph L. Savage	327 75

Class No. 53. Tools for yard use:

Hyatt & Spencer	†252 28
Taylor, Martin & Co	*283 25
D. Babcock & Co	329 30
George H. Creed	366 70

Class No. 54. Hardware:

Hyatt & Spencer	2,617 90
Taylor, Martin & Co	*2,521 55
D. Babcock & Co	2,975 65
George H. Creed	2,630 20

Class No. 56. White-lead:

Hyatt & Spencer	1,271 87
D. Babcock & Co	1,361 25
George H. Creed	1,265 00
Joseph L. Savage	1,320 00
Witherall & Bros	1,265 00
Fahnestock, Haslett & Schwartz	*1,178 65

* Accepted. † Rejected. ‡ Class not awarded. § Decided by lot.

Class No. 57. Zinc paint:‡	
Hyatt & Spencer	$1,122 50
D. Babcock & Co	1,186 25
George H. Creed	1,135 00
Joseph L. Savage	1,043 75
Class No. 58. Colored paints:	
Hyatt & Spencer	589 00
D. Babcock & Co	725 00
George H. Creed	*452 00
Joseph L. Savage	626 75
Class No. 59. Linseed-oil:	
Hyatt & Spencer	†975 00
D. Babcock & Co	1,025 00
George H. Creed	*1,015 00
Joseph L. Savage	1,100 00
Lookin & Myers	1,150 00
Class No. 60. Varnish, &c.:	
Hyatt & Spencer	†361 15
D. Babcock & Co	*409 75
George H. Creed	411 50
Joseph L. Savage	415 65
D. & J. Noblit	415 50
Class No. 63. Sperm and lard oil:	
Hyatt & Spencer	†966 00
D. Babcock & Co	1,100 00
George H. Creed	*992 00
Joseph L. Savage	1,024 00
D. & J. Noblit	1,144 00
Hastings & Co	1,312 00
Class No. 64. Tallow, soap:	
Hyatt & Spencer	†132 75
D. Babcock & Co	*141 00
George H. Creed	150 00
Joseph L. Savage	155 00
Lookin & Myers	164 00
Class No. 68. Glass:	
Hyatt & Spencer	433 80
Taylor, Martin & Co	508 00
George H. Creed	*276 70
Joseph L. Savage	297 00
Class No. 69. Brushes:‡	
Hyatt & Spencer	105 19
Taylor, Martin & Co	124 50
D. Babcock & Co	133 30
George H. Creed	129 50
Joseph L. Savage	99 75
Class No. 70. Dry goods:	
Hyatt & Spencer	†28 10
Taylor, Martin & Co	80 00
D. Babcock & Co	87 00
George H. Creed	412 00
Lookin & Myers	*57 50
Class No. 71. Stationery:	
W. Choate & Co	*281 61
W. H. Dempsey	330 81
Wm. Ballantyne	$285 90
Lookin & Myers	476 64
P. W. Derham	432 80
Class No. 72. Crucibles:‡	
Hyatt & Spencer	477 85
Taylor, Martin & Co	545 00
D. Babcock & Co	540 00
George H. Creed	574 50
Joseph L. Savage	531 00
Class No. 73. Ship-chandlery:	
Hyatt & Spencer	1,174 65
Taylor, Martin & Co	1,425 71
D. Babcock & Co	*1,110 51
Class No. 74. Acids:‡	
Hyatt & Spencer	177 42
D. Babcock & Co	342 75
George H. Creed	329 00
Joseph L. Savage	215 25
Class No. 75. Resin, pitch, &c.:	
Hyatt & Spencer	232 50
D. Babcock & Co	190 00
George H Creed	197 50
Lookin & Myers	*165 00
Class No. 77. Belting, packing:‡	
Hyatt & Spencer	103 50
Taylor, Martin & Co	127 00
D. Babcock & Co	132 00
George H. Creed	145 00
Joseph L. Savage	133 50
Class No. 78. Leather:	
Hyatt & Spencer	47 50
Taylor, Martin & Co	60 00
D. Babcock & Co	47 50
George H. Creed	62 50
Joseph L. Savage	43 00
Lookin & Myers	*40 00
William Conn	42 50
Class No. 82. Bellows:	
Taylor, Martin & Co	36 00
Joseph L. Savage	24 00
Lookin & Myers	*18 00
Class No. 85. Anthracite coal:	
Peters & Bros	1,708 00
D. Babcock & Co	*1,671 60
Class No. 87. Bituminous coal:	
Peters & Bros	10,200 00
D. Babcock & Co	10,370 00
Alex. Ray, agent	9,945 00
Consolidation Coal Co	*9,316 00
Class No. 88. Charcoal:	
Taylor, Martin & Co	*540 00
Lookin & Myers	750 00

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*

NAVY DEPARTMENT, BUREAU OF CONSTRUCTION AND REPAIR, *May* 27, 1873.

* Accepted. † Rejected. ‡ Class not awarded.

*Offers to furnish material for the Navy under the advertisement of the Bureau of Construction and Repair of April 29, 1873, at the navy-yard, Mare Island, California.**

Class No. 4. Oregon pine deck-plank:

A. Powell	$11,200 00
J. E. de la Montagnie	10,400 00
S. P. Brown	10,880 00

Class No. 7. Oregon-pine logs:

A. Powell	4,657 15
J. E. de la Montagnie	4,383 20

Class No. 8. Oregon-pine beams:

A. Powell	3,773 75
J. E. de la Montagnie	3,622 80
S. P. Brown	4,226 60

Class No. 13. Sugar-pine plank, boards:

A. Powell	2,625 00
J. E. de la Montagnie	2,450 00
S. P. Brown	3,200 00

Class No. 15. White-ash redwood:

A. Powell	2,880 00
J. E. de la Montagnie	2,700 00
S. P. Brown	1,230 00
Watson & Pittinger	1,860 00

Class No. 16. White-ash oars:

Farwell & Co	1,300 00
Watson & Pittinger	4,900 00

Class No. 18. Black walnut, &c:

A. Powell	2,750 00
J. E. de la Montagnie	2,600 00
S. P. Brown	2,230 00
Watson & Pittinger	2,490 00

Class No. 24. White-oak staves and headings:

A. Powell	5,500 00
David Babcock & Co	4,100 00

Class No. 32. Iron, round and square:

Farwell & Co	5,120 00

Class No. 33. Iron, flat:

Farwell & Co	3,483 62

Class No. 34. Iron plate:

Farwell & Co	900 00

Class No. 37. Iron spikes:

Farwell & Co	$736 00

Class No. 39. Iron cut nails:

Farwell & Co	940 00

Class No. 48. Locks, hinges, &c:

Farwell & Co	1,407 60

Class No. 49. Screws of brass and iron:

Hyatt & Spencer	427 89
Farwell & Co	557 65

Class No. 50. Files:

Hyatt & Spencer	1,731 12
Farwell & Co	2,872 20

Class No. 51. Augers:

Hyatt & Spencer	1,267 06
Farwell & Co	1,235 50

Class No. 52. Tools for stores:

Farwell & Co	3,085 10

Class No. 53. Tools for yard use:

Farwell & Co	1,884 90

Class No. 54. Hardware:

Farwell & Co	2,826 65

Class No. 56. White lead:

Farwell & Co	1,237 50

Class No. 57. Zinc-paint:

Farwell & Co	525 00

Class No. 58. Colored paints, dryers:

Farwell & Co	939 25

Class No. 59. Linseed-oil:

Farwell & Co	2,500 00

Class No. 60. Varnish, spirits turpentine:

Farwell & Co	2,262 50

* No contracts made for this yard.

Class No. 63. Sperm and lard oil:

Farwell & Co	$600 00
Hastings & Co	630 00

Class No. 64. Tallow, soap:

Farwell & Co	300 00

Class No. 65. Fish-oil:

Farwell & Co	81 00

Class No. 68. Glass:

Farwell & Co	1,410 00

Class No. 69. Brushes:

Farwell & Co	534 35

Class No. 70. Dry-goods:

Farwell & Co	894 00

Class No. 71. Stationery:

W. H. Dempsey	642 61
Wm. Ballantyne	578 05
L. H. Bonestall	540 91

Class No. 72. Crucibles:

Hyatt & Spencer	$123 50
Farwell & Co	192 00

Class No. 73. Ship-chandlery:

Farwell & Co	460 51

Class No. 77. Belting, packing:

Farwell & Co	2,178 35

Class No. 78. Leather:

Farwell & Co	173 50
William Conn	215 80

Class No. 87. Bituminous coal:

A. Powell	7,620 00
George S. Hoag	6,377 00
David Babcock & Co	5,962 50

Class No. 88. Charcoal:

A. Powell	750 00
George S. Hoag	450 00

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*

NAVY DEPARTMENT, BUREAU OF CONSTRUCTION AND REPAIR, *May* 27, 1873.

No. 11.

MARINE CORPS.

HEADQUARTERS MARINE CORPS,
Washington, October 28, 1873.

SIR: I have the honor to report that I recently made a thorough inspection of the principal marine stations, and it gave me pleasure to find the troops in a most excellent state of discipline and efficiency, and the public property under their immediate charge in good order and well cared for. The duties of marines at the several navy-yards being chiefly confined to guarding the public property, there is little occasion for that active military duty which perfects the soldier in his profession; yet the equipment, drill, and high state of discipline of the several commands were all that could be desired, and gave assurance that if ever required for more active duty, the country would not be disappointed in them. At the stations where there are permanent barracks, the quarters and grounds were in the best condition, and will require merely the ordinary repairs during the coming year to keep them so. At Annapolis and Pensacola, the troops still occupy temporary buildings belonging to the Navy proper, which have heretofore, perhaps, answered the purpose very well, yet they are but very lightly-built structures, and cannot be much longer used for the purpose without extensive repairs. At Norfolk the

men are still quartered on board the old ship St. Lawrence, which vessel I found very much in need of repairs, the decks being in such a leaky condition that, during wet weather, she is a very uncomfortable place of abode for the troops. It will require a considerable outlay to place this vessel in good order, as she requires a general and thorough overhauling. I have annually, for several years past, referred to the want of a good and permanent barracks at this station, and recur to the subject again with the hope the Department may deem it proper to invite the attention of Congress to the subject at the approaching session. This yard has again become one of the principal naval stations, and, in my judgment, should have a large and efficient force of marines at all times in readiness for service in permanent quarters within the yard, or immediately adjacent thereto. It is believed that a good and proper site within the present boundaries could be spared, without interfering with the naval operations of the yard.

The general monthly return of the corps, transmitted to the Department a few days ago, shows that there are at present 2,331 enlisted men in the corps, of which number about 1,000 are on board vessels in commission, and the remainder at the several shore stations. The corps is now 170 men short of its complement, but as recruits are readily obtained, it will soon be up to its authorized strength. Desertions have not been so numerous during the past year as heretofore, yet still a large number leave the service in this manner. The special attention of commanding officers has been called to this subject, and I am satisfied that every effort, consistent with the good of the service, has been made by them to check the evil. Recruiting officers have been enjoined to enlist none but men of good moral character and habits, so far as can be ascertained; the regulations with regard to pay, rations, clothing, &c., have been strictly conformed to, and every possible indulgence granted to the men; yet, notwithstanding all this, the crime still continues painfully frequent, and is beyond any remedy that I can apply.

The public attention seems to have been directed recently to the band of the Marine Corps, and it is now become to be generally regarded as a national band. Being at the seat of Government, it is at all times under the immediate orders of the Department, and its services are called for on all occasions of public ceremony, civic, as well as military. It is, therefore, very desirable that it should be placed upon a more respectable footing as regards its organization, pay, &c. Its numbers should be increased, and the pay fixed at such a rate that the services of first-class musicians could be at all times commanded. In deference, therefore, to the general desire of the public, I cordially commend the subject to the consideration of the Department.

The estimates for the support of the corps for the coming fiscal year have been confined to the absolute wants of the service, and are rather less in amount than those submitted for the last year.

I am, very respectfully, your obedient servant,

J. ZEILIN,
Brigadier-General and Commandant.

HON. GEO. M. ROBESON,
Secretary of the Navy, Washington, D. C.

HEADQUARTERS MARINE CORPS,
Quartermaster's Office, Washington, August 29, 1873.

SIR: I have the honor to transmit herewith duplicate "estimates of appropriations required for the service of the fiscal year ending June 30,

1875, by the Quartermaster's Department, Marine Corps. These estimates vary from those submitted for fiscal year ending June 30, 1874, as follows:

Contingencies, increased	$10,000
Clothing, decreased	46,157
Military stores, increased	2,000
Repair of barracks, increased	2,000
Rent of rooms, decreased	344
Forage, inereased	300

The aggregate amount of these estimates is $37,201 less than that asked in estimates of previous year.

I also inclose duplicate schedules of proposals received for rations, fuel, and supplies, current fiscal year.

I am, very respectfully, your obedient servant,

W. B. SLACK,
Quartermaster Marine Corps.

Brig. Gen. J. ZEILIN,
Commandant Marine Corps, Headquarters Washington, D. C.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1875, by the Quartermaster's Department, Marine Corps.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1874.
PROVISIONS.		
1,333 non-commissioned officers, musicians, privates, and washerwomen, 365 days, one ration per day, 486,545, at 25 cents per ration, is	$121,636 25	$121,636 25
CLOTHING.		
2,560 non-commissioned officers, musicians, and privates, at $42.15 per annum, (actual cost per contract 1873 and 1874,) is $105,375, and 1,600 watch-coats, at $10.06½ each, is $16,104, in all	121,479 00	167,636 00
FUEL.		
4,408 cords of wood, as follows: One brigadier-general, one colonel, two lieutenant-colonels, four majors, three staff majors, twelve captains, two staff captains, thirty first and second lieutenants, fourteen hundred non-commissioned officers, musicians, privates, and washerwomen, six hospitals, one armory, seven mess-rooms for officers, sixteen offices for the commandant and staff and commanding officers at posts, eight rooms for officers of the day, ten guard-rooms at barracks and navy-yards, three clothing and other supply stores. One-fourth additional on 2,400 cords, quantity supposed to be required in latitude north 36 degrees, from September 1 to April 30, 600 cords, amounting to, in all, 4,408 cords, which, at $7 per cord, is	30,856 00	30,856 00
MILITARY STORES.		
Pay of mechanics, repair of arms, purchase of accoutrements, ordnance stores, flags, drums, fifes, and other instruments	12,000 00	10,000 00
TRANSPORTATION AND RECRUITING.		
Transportation of troops and for expenses of recruiting	12,000 00	12,000 00
REPAIR OF BARRACKS.		
Repair of barracks, and rent of offices where there are no public buildings.	12,000 00	10,000 00
RENT OF ROOMS.		
Hire of quarters for officers where there are no public buildings	18,000 00	16,500 00

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1874.
FORAGE.		
Forage for public horses and for field and staff officers' horses.....	$7,500 00	$6,000 00
CONTINGENCIES.		
For freight, ferriage, toll, cartage, wharfage, purchase and repair of boats, per diem for constant labor; burial of deceased marines; stationery, telegraphing, apprehension of deserters, oil, gas, candles, repair of gas and water fixtures, water rent; barrack-furniture, furniture for officers' quarters, and for staff and commanding officers' offices, bed-sacks, wrapping-paper, oil-cloth, crash, rope, twine, carpenters' tools, tools for police purposes; purchase and repair of hose; repairs to public carryall; purchase and repair of harness; purchase and repair of hand-carts and wheelbarrows; purchase and repair of cooking stoves, ranges, &c.; stoves where there are no grates; gravel, &c., for parade grounds; repair of pumps, paving, and for other purposes.....	40,000 00	25,000 00

Respectfully submitted.

W. B. SLACK,
Quartermaster Marine Corps.

HEADQUARTERS MARINE CORPS,
Paymaster's Office, August 23, 1873.

SIR: I have the honor to submit herewith estimates for the pay of officers, non-commissioned officers, musicians, privates, and others of the United States Marine Corps for the fiscal year ending June 30, 1875.

These estimates are $17,199 less in amount than the sum appropriated for the present fiscal year.

I am, very respectfully, yours, &c.,

J. C. CASH,
Paymaster Marine Corps.

Brig. Gen. JACOB ZEILIN,
Commandant United States Marine Corps, Headquarters.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1875, by the Paymaster's Department of the United States Marine Corps.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1874.
PAY OF OFFICERS, NON-COMMISSIONED OFFICERS, MUSICIANS, PRIVATES, AND OTHERS OF THE UNITED STATES MARINE CORPS.		
1 brigadier-general, commandant	$5,500 00	
1 colonel	4,500 00	
2 lieutenant-colonels	8,000 00	
1 lieutenant-colonel, retired	3,000 00	
4 majors	13,750 00	
2 majors, retired	4,875 00	
1 adjutant and inspector, 1 paymaster, and 1 quartermaster	10,500 00	
2 assistant quartermasters, per act of June 30, 1834, (4 Stat. at L., p. 713, secs. 4, 5.)	5,200 00	
1 assistant quartermaster, retired, per act of March 2, 1847, (9 Stat. at L., p. 155, sec. 3.)	2,100 00	
20 captains, per act of August 5, 1854, (10 Stat. at L., p. 586, sec. 1)	44,100 00	
4 captains, retired, per act of February 21, 1857, (11 Stat. at L., p. 163, sec. 1)	6,615 00	
30 first lieutenants, per act of July 17, 1862, (12 Stat. at L., p. 594, sec. 2)	52,500 00	
30 second lieutenants, per act of June 20, 1864, (13 Stat. at L., p. 144, sec. 1)	44,100 00	
2 second lieutenants, retired, per act of March 3, 1865, (13 Stat. at L., p. 487, sec. 1.)	2,100 00	
1 sergeant-major, 1 quartermaster sergeant, and 1 drum-major, per act of July 28, 1866, (14 Stat. at L., p. 337, sec. 13.)	1,080 00	
1 leader of the band, per act of July 28, 1866, (14 Stat. at L., p. 422, sec. 37)	948 00	
50 first sergeants, at $27 per month, per act of March 2, 1867, (14 Stat. at L., p 517, sec. 1.)	16,200 00	
140 sergeants, 90 at $17 and 50 at $22 per month, per act of March 2, 1867, (14 Stat. at L., sec. 7.)	31,560 00	
180 corporals, 130 at $15 and 50 at $20 per month, per act of July 15, 1870	35,400 00	
30 musicians of the band, 7 at $40, 8 at $26, and 15 at $23 per month, per act of May 15, 1872, (secs. 1, 2, 3, 4.)	9,996 00	
96 drummers and fifers, 50 at $13 and 46 at $18 per month	17,726 00	
2,000 privates, 1,000 at $13, 500 at $16, and 500 at $18 per month	360,000 00	
9 clerks to brigadier-general commandant, adjutant and inspector, quartermaster, and paymaster.	12,883 00	
1 messenger at headquarters	971 00	
1 clerk and 1 messenger in assistant quartermaster's office, Philadelphia	1,576 00	
1 hospital-steward at headquarters	750 00	
Undrawn clothing	25,000 00	
Allowance to officers traveling under orders unaccompanied by troops	8,000 00	
Postage on public mail-matter	1,200 00	
Printing and binding under direction of Congressional Printer	300 00	
	730,440 00	$747,639 00

Respectfully submitted.

J. C. CASH,
Paymaster Marine Corps.

HEADQUARTERS MARINE CORPS,
Paymaster's Office, August 23, 1873.

ABSTRACT OF OFFERS RECEIVED FOR FURNISHING RATIONS, FUEL, AND SUPPLIES TO THE UNITED STATES MARINE CORPS, UNDER THE COGNIZANCE OF THE QUARTERMASTER'S DEPARTMENT.

Offers for rations, under advertisement dated April 24, 1873.

	Per hundred.
At Portsmouth, N. H.:	
Henry M. Clark	$28 00
Samuel J. Gerrish	29 50
Samuel Gamage	27 65
N. F. Mathes	*23 50
Nathan Baum	35 40
John C. Gilbert	26 75
Hall & Hume	$23 53
Kimberly Bros	34 00
At Charlestown, Mass.:	
Samuel J. Gerrish	34 50
Samuel Gamage	25 45
N. F. Mathes	23 50

*Accepted.

	Per hundred.
James J. Convery	$27 25
Nathan Baum	35 40
Peter Higgins	*23 47½
John C. Gilbert	24 75
Hall & Hume	23 50
Kimberly Bros	32 50
At Brooklyn, N. Y.:	
Samuel J. Gerrish	33 50
Samuel Gamage	24 45
N. F. Mathes	24 75
Walter Reckless	24 90
James J. Convery	25 75
Nathan Baum	34 60
John C. Gilbert	*22 42½
Hall & Hume	22 45
Kimberly Bros	31 80
At Philadelphia, Pa.:	
Samuel Gamage	23 45
N. F. Mathes	25 75
Walter Reckless	*21 45
Nathan Baum	34 50
John C. Gilbert	23 45½
Hall & Hume	21 50
Kimberly Bros	30 00
At Washington, D. C.:	
Samuel Gamage	18 99
N. F. Mathes	26 40
Frank Hume	18 75
Nathan Baum	30 40
John C. Gilbert	*17 43
H. W. Hall	17 44
Hall & Hume	18 43
Kimberly Bros	25 47
At Gosport, Va.:	
Samuel J. Gerrish	$36 50
Samuel Gamage	27 45
N. F. Mathes	25 30
Nathan Baum	36 15
John C. Gilbert	29 75
Hall & Hume	23 50
Kimberly Bros	*23 45
At Pensacola, Fla.:	
Hugh McHatton	26 42
T. C. Quayle	26 99
Samuel J. Gerrish	33 25
Samuel Gamage	28 00
N. F. Mathes	*26 40
John C. Gilbert	33 00
At Annapolis, Md.:	
John Kealy	22 45
Samuel Gamage	21 45
N. F. Mathes	27 75
Nathan Baum	34 20
John C. Gilbert	*21 22½
Hall & Hume	21 25
Kimberly Bros	28 00
At Mare Island, Cal.:	
John E. Williston	23 75
Wooster & Shattuck	23 60
E. J. Wilson	24 00
Samuel J. Gerrish	33 60
J. F. Tobin	25 00
Samuel Gamage	25 90
N. F. Mathes	*23 55
John C. Gilbert	34 00

Offers for fuel under advertisement dated April 26, 1873.

At Portsmouth, N. H.:

	Wood per cord.
Russell & Odion	*$10 90
	Coal per ton.
Russell & Odion	11 60
Jos. Lise	11 75
J. A. Walker	†11 50

At Charlestown, Mass.:

	Wood per cord.
Samuel Knight	*12 00
	Coal per ton.
Samuel Knight	*8 25

At Brooklyn, N. Y.:

	Wood per cord.
C. M. Felt	*9 11
A. F. Nathan	10 25
	Coal per ton.
C. M. Felt	*$6 73
A. F. Nathan	7 85

At Philadelphia, Pa.:

	Wood per cord.
Jas. Ballenger	*8 50
Jas. J. Convery	10 00
	Coal per ton.
Jas. J. Convery	*7 95

At Washington, D. C.:

	Wood per cord.
W. H. Barbour	6 67
Walsh & Queen	7 43
T. E. Clark & Co	*6 45
Chas. H. Bliss	7 18
Thos. Seabrook	7 50

*Accepted.

†Not accepted.

	Coal per ton.
W. H. Barbour	$6 65
Walsh & Queen	*6 37
T. E. Clark & Co	6 45

At Gosport, Va.:

	Wood per cord.
Lookins & Myers	*5 45
Peters Brothers	6 50

	Coal per ton.
Lookins & Myers	8 75
Peters Brothers	*7 75

At Annapolis, Md.:

	Wood per cord.
Jno. Kealy	*7 50
J. H. Broughton	8 00
T. W. Clapen	7 90

At Mare Island, Cal.:

	Wood per cord.
Jas. McCudden	*$12 25
A. Powell	18 00

	Coal per ton.
Jas. McCudden	*21 95
A. M. Ebbetts	23 40
A. Powell	33 00

At Pensacola, Fla.:

	Wood per cord.
Hugh McHatton	*5 48
T. C. Quayle	6 47
H. C. Anderson	6 00

Offers for supplies under advertisement dated May 1, 1873

Class No. 1. Kerseys, &c.:

Wm. Mathews	$54,618 00
Peter Higgins	56,950 00
Devlin & Co	64,980 00
Donald McLellan	52,890 00
R. S. Allen	*41,170 00
Allan Cameron	50,530 00
Glenham Co	†24,530 00

Class No. 2. Flannels, &c.:

Wm. Mathews	*19,931 00
Geo. Fling	†1,215 00
Nichols, Price & Co	†1,260 00
Devlin & Co	25,537 50
Donald McLellan	24,453 00
Allan Cameron	23,650 00

Class No. 3. Linens, &c.:

Wm. Mathews	*10,650 00
Devlin & Co	11,030 00
W. J. McGucken	†8,400 00

Class No. 4. Uniform-caps, &c.:

Walton Brothers	6,627 00
Geo. D. Putnam	†3,375 00
Bent & Bush	‡5,756 00

Class No. 5. Military equipments:

Walton Brothers	‡$900 70
Horstmann Bros. & Co	‡1,553 95
W. S. Hansell & Sons	†206 30
Paul I. Field	†507 75

Class No. 6. Bootees:

Jno. Mundell	20,400 00
C. R. Williamson	15,440 00
Geo. W. Randall	13,120 00
T. Pratt Potts	19,840 00
Walton Brothers	*12,800 00
J. Freeman & Co	18,320 00
Jacob Roedel & Sons	14,320 00

Class No. 7. Knapsacks, &c.:

Walton Brothers	‡4,101 00
T. A. Sloan	5,865 00
Horstmann Bros. & Co	‡62 50
S. H. Condict & Co	5,321 50

Class No. 8. Making and trimming clothing:

Wm. Mathews	33,511 00
W. A. Howell & Co	§26,049 80
Jacob Reed	22,994 75
Chas. Barnum	20,952 50
Devlin & Co	41,019 50
R. S. Allen	*18,340 50
Brantley & Leach	32,077 50

* Accepted. † Part of a class. ‡ Accepted for part of a class. § Informal.

W. B. SLACK,
Quartermaster Marine Corps.

HEADQUARTERS MARINE CORPS,
Quartermaster's Office, Washington, August 29, 1873.

No. 12.

DARIEN EXPEDITION.

REPORT OF THE SURVEY OF THE ISTHMUS OF DARIEN FOR 1873, BY COMMANDER THOS. O. SELFRIDGE, UNITED STATES NAVY.

NAVY-YARD, BOSTON, *June* 12, 1873.

SIR: I have the honor to lay before you my report of the operations of the expedition under my command for the further survey of the Isthmus of Darien.

In obedience to your order I commenced the necessary preparations in December last; and on the steamer of January 1 "for Aspinwall," were embarked the officers detailed to accompany me: Lieutenants Collins, Eaton, Sullivan, and Assistant Paymaster Ring, with the necessary provisions, material, and instruments. I was myself prevented by illness from leaving for the Isthmus until the following steamer on January 10.

From the reports and maps of the expeditions of 1870 and 1871, it will be seen that the survey of the Darien Isthmus had been completed as far south as the Napipi River, and the appearance of the country in the valley of the latter, as far as our time permitted us to explore, gave the promise of most excellent results. We were encouraged, therefore, in the hope that a more extensive and detailed exploration would justify the time employed, and return a gratifying success.

It will not be out of place here to repeat what has been the general plan of all these surveys, for it is upon this basis that I feel confident in deciding that no portion of Darien possible for a ship-canal has been left unvisited.

The density of the tropical growth is such that any survey cut blindly through its forests would indicate but little knowiedge beyond a few hundred feet aside of the surveyor's path. It became a question, then, what course to adopt, and I was led to this plan by the advice of Commodore Ammen, who has given much time and matured thought to the great problem of a ship-canal, and may be regarded as the pioneer of the work which I have been so fortunate as to be called upon to carry out.

With the simple law that water seeks always the lowest level, it follows that, having obtained the elevation of a water-course or river, you have the lowest level of the whole region drained by such rivers. And I would endeavor to particularly impress this feature of these surveys, for upon it rests the assumption that there is no portion of the Darien Isthmus as favorable for the construction of the ship-canal as the valleys of the Napipi and Doguado.

An examination of the general map of the Isthmus will show that the Cordilleras skirt the Atlantic coast as far as Cape Tiburon, and not only from the deck can no pass be seen, but the examination of the little rivers proved conclusively that they drained only the Atlantic slope, a fact that received an additional corroboration from the reports of Indians and traders.

There is but one exception, the Mondinga River, which empties into San Blas Bay at the narrowest part of the Isthmus. Here the Cordilleras recede, and the dividing range being afterward, as appeared, hid by an intervening ridge through which the Mondinga, by a series of falls, had forced itself, seemed very much depressed, and for a long time gave sanguine hopes of success.

The Pacific slope, as shown on the general map of the Isthmus, is

drained by two large rivers, the Chucunagua and Bayamo, both rising in a transverse spur of the Cordilleras, and therefore indicating that only in the region adjoining their lower portions could be found a sufficiently low elevation for our purpose. A careful study of the Isthmus map indicates pretty thoroughly those portions where explorations should be conducted, and have all been examined by the spirit-level or carefully recorded barometrical observations.

The Cordilleras, as has been remarked, recede from the Atlantic coast at Cape Tiburon, and running about south-southwest strike the west coast at Cape Marzo, at which point, and as far as Solam Point, the dividing range rises almost perpendicularly from the ocean. The Atrato now becomes the drainer of the eastern slope, as is the river Tuyra that of the western.

It was reasonable to hope that the valley of the latter, with a line leaving it at a moderate elevation and running east so as to strike the great river Atrato at a low level and but a short distance from the sea, would be found adapted to our wants. But such was not the case, owing to no very high elevations, but to the hilly nature of the country bordering upon the Tuyra, which made the estimate of excavation enormous.

Continuing south we come to the valley of the Truando, which, thoroughly surveyed by the combined Army and Navy expeditions of Michler and Craven, required no further explorations.

The next point that presented itself, on account of the very short distance between the Atrato, which is to this point navigable for the largest ships, and the Pacific, was the valley of the Napipi. The severe labors imposed upon the members of the expedition of 1871 left me no time to examine thoroughly this river, though my reconnaissance of it left such favorable impressions that I was not willing to abandon it, and had given me a conviction that here was the favored spot for the location of the great enterprise.

Information received from what was then supposed reliable sources, also pointed to the next tributary south of the Napipi, known as the Bojoya, as being generally lower than the Napipi.

Here, then, lay the work of the expedition of 1873, and its completion would exhaust the profitable region to be explored, and enable me to report to the Department that the surveys of the Darien Isthmus for an interoceanic canal were finally and entirely finished.

As our operations would be carried on from the Pacific shore, you were pleased to detail the Tuscarora, Commander Belknap, to co-operate with me, and he did all in his power to render the expedition successful.

The region to be explored being confined in extent, did not require as large supplies of provisions, materials, and laborers as upon former expeditions, though the work, being of the same nature, was equally harassing. I had supplied generally the same kind of food as before, adding, however, the article of corn-meal put up in tin canisters, which, from its nutritious properties, and the variety of ways in which it could be cooked, even with our rude camp apparatus, was greatly relished, and I can heartily recommend it as a valuable article of food to any future explorers.

I proposed to use the gradienter only upon our surveys. This unique instrument, described in a former report, furnished by Wurdeman, of Washington, proved to be all that I had expected, and enabled us to keep our parties down to the minimum in numbers, a very necessary requirement when every article and every pound of food had to be car-

ried on the backs of our sailors, there being no inhabitants except a few scattering Indians.

It not being possible to obtain any natives at Panama, and it having been represented to me that they could perhaps be procured at a little town called Valle, about thirty miles south of Cupica Bay, at the mouth of a small river called the Bahia, we sailed from Panama on Thursday, January 23. The wet season had proved very late, and up to this time the rains had not entirely ceased.

Valle comprises only a few huts, inhabited by Indians and a few peons who are employed by the head-men of the place, a mulatto named Gonzaloz, in collecting "tagna," or ivory-nuts, which is the sole article exported from the place. It required a great deal of palaver to engage even a man to go with us, the Indians being afraid, and the peons were mostly away; and it was not till Tuesday, the 28th, that we were able to leave, having engaged three negroes, two Indians, and a castaway sailor. No better proof of the general healthiness of this part of the coast can be given, than the fact that this sailor, named Paul, and a German whom we found here, had lived in this place six years and had never had but a single attack of fever.

COMMENCEMENT OF OPERATIONS.

As has been here stated, the objective point of the expedition was the easternmost indentation in the coast line, and it was also desirable to anchor as near as possible to the head-waters of the Bojaya River, the survey of which would occupy the largest portion of our time and force.

The most eastern point was not hard to find, but it was impossible for us to tell which was the nearest position to the Cuia or Bojaya Rivers. On this account we sailed first to Limon Bay, where I landed one of our peons named Alvarez, and his *companero*, with orders to go down the Napipi, then to cross over to the Cuia River and obtain an Indian guide to show them the trail over the hills to the Pacific.

The Tuscarora then steamed about seven miles south of Limon Bay to the most eastern point, near the mouth of a small river called Chiri-Chiri, which gives the name to the bay in which we anchored.

Desiring to lose no time, I sent Lieutenants Eaton and Sullivan out with our best Indian, Richardo, to endeavor to find the trail leading over the divide. Upon their return they reported the Indian had been able to find the trail, though it was very blind, and that in an hour's walk from the ship they had struck the head-waters of a river which I supposed then was the Cuia, but which proved to be the Doguado.

Without waiting any further intelligence from Alvarez, I ordered Lieutenant Collins to organize his party No. 1, consisting of himself and Midshipman Galt, with four sailors and four macheta-men. They landed January 31, with two weeks' provisions, established Camp No. 1 at the mouth of the Chiri-Chiri, and commenced work in the afternoon from bench-mark No. 1, cut on a cocoanut-tree growing on the beach at the edge of high water.

Party No. 1 at the end of the first day struck the foot of the dividing ridge, and the line was run up a very steep spur over the Indian trail, rising in many places at an angle of 70°, and so steep that often the foresights would not be over 5 feet in length.

The following week Camp No. 2 was established on the Doguado, and the provisions and material were transported to it after a great deal of hard work on account of the extreme steepness of the ascent.

The divide between the sea and the Doguado at its highest point was

found to be 758 feet, though more to the northward, near the headwaters of the Chiri-Chiri, it was evidently much lower, but we could not level over it on account of the steepness of the hill-sides.

In the mean while Alvarez had returned from the Cuia, with an Indian named Pedro. From him I was enabled to obtain a better-defined knowledge of the country. I found that the river near the coast was called the Turcundo, and that it joined the Cuia at a point about twelve miles distant from the beach.

In a personal reconnaissance I found it would be impossible to carry the survey over the Indian trail beyond Camp No. 2, as it led over a ridge 1,900 feet high, and there was but one place where water could be procured in a distance of eight miles. I therefore ordered Lieutenant Collins to strike an east-southeast course from Camp No. 2 to the Turcundo, and, as the position of the river was uncertain, to send out reconnoitering parties, in which duty he was assisted by Lieutenant Sullivan, to find the lowest ascent.

The work of transporting their camp material and provisions with that of the survey over this very rugged country was so severe on this little party that it became necessary to strike the river as soon as possible, where I hoped to be able to use canoes for the purpose of transportation. Some peons I dispatched to bring light canoes up the Turcundo came back and reported that on account of impassable falls it was impossible to do so.

Not knowing how far I should have to work down the Turcundo to get to our canoes, I at first made up my mind to abandon the line and commence again on the Indian trail. Still I was loth to do this, because nothing is more discouraging to men engaged in this work than to turn back and go over ground gained only by severe labor.

Upon visiting party No. 1 at their camp on the Turcundo, and after receiving a report of a reconnaissance of the river below, I determined to allow the survey to go on. As it turned out, a very fortunate conclusion, for my after-experience of the Indian trail over the country to the Cuia proved that a survey of it would have been painfully slow and laborious, owing to the very rugged country and the lack of water.

Upon my return to the ship, party No. 2 was organized, composed of Lieutenant Eaton, in charge, Lieutenant Sullivan, Midshipman Miles, and four sailors, with the necessary number of natives.

It had been my original intention to have had two parties under the above lieutenants, but the difficulty of supplying them with provisions and keeping up communication when widely separated compelled me to consolidate our means, an arrangement, as it proved, which was decidedly for the best.

While these several operations were in progress I dispatched a native carrier across the Napipi trail to my agent, Don Carlos Lemos, at Vijia, to send me a number of canoes and men to the junction of the Ciua and Turcundo Rivers. These Atrato men are athletic, industrious, and docile, and were, by far, the best help that I have employed on the Isthmus. In the event of building a canal probably one thousand of them could be gathered for that purpose, and kept up to this strength. Being excellent woodsmen, they would be invaluable in the first operations of clearing the country, building roads, and preparing the ground for the necessary railway.

To subsist party No. 2 it became necessary to make a depot at the mouth of the Turcundo, where was our camp known as Camp Relief.

Let it be remembered there were no roads in this wilderness, no maps, our topographical knowledge very limited, until by degrees we were

able to map down the different ridges, rivers, and valleys. The only path was an Indian trail, rarely used, and so blind as only to be picked out by the natives of the forest. Like all such paths it led over the highest ground, making the transportation of our provisions and material a work of painful labor, and, to add to all, water was to be obtained at rare intervals. About thirteen hundred pounds was to be transported, and for this purpose Commander Belknap organized a provision-train of some sixty-five men. Including their own provisions this gave each man a load of about thirty pounds, and in a most inconvenient shape, as all our provisions were necessarily packed in water-tight kegs and boxes.

Party No. 2, Lieutenant Eaton in charge, and the provision party under Lieutenant Hubbard left the ship at noon February 19, and camped for the night at Camp No. 2 on the Doguado. The next day Lieutenant Eaton reached Camp Relief at the junction of the Cuia and Turcundo Rivers. But though this distance was but twelve miles, it took two days to get over the provisions, and the men toward the last were so worn out that they were obliged to lay down their burdens every few minutes and rest.

On the third day after their departure the provision party came straggling back, a few at a time, and their appearance was a sufficient sign of the difficulties of transportation in this rugged wilderness.

An accident happened to one of the men, named Turner, of the provision party, which filled us with grave apprehensions. Becoming too exhausted to move on to camp, he laid down on the trail. During the night, becoming rested, he attempted to regain the camp and lost his way. As soon as the fact was known at the ship a party of natives and Indians were dispatched in search, stimulated by a large reward. The search was kept up a week without any success beyond finding some of his tracks. Finally, after being given up as dead, he was brought alongside by a native after an absence of thirty-five days. It appeared he wandered for three weeks in the woods, subsisting entirely on roots, when he finally reached the sea-shore. Here, when almost exhausted, he was found by one of the natives of Cupica Village, who cared for him until he was in a condition to return.

The operations of the survey being now well under way and requiring no longer a personal supervision, I proposed to make, in person, an extended reconnaissance of the whole ground, and a running survey of the river Atrato as far as Quibdo, some one hundred and twenty miles above the Vijia Funte, up to which point the Atrato survey had been carried the year previous; for which purpose I left the ship February 25, accompanied by two Indians as guides and provision bearers, crossed the hills, and reached Camp Relief, the head of navigation, after a toilsome march of a day and a half. Here I embarked in a canoe with Lieutenant Collins, and proceeding down the Cuia and Bojaya Rivers arrived at the Atrato after a passage of ten days.

I was much disappointed at the aspect of the country bordering on the Cuia. Not only was the intervening region between its head-waters and the Pacific much more mountainous than the corresponding country of the Napipi, but high ranges of hills were met with, first on one bank and then on the other, not seen at all in the valley of the Napipi, and gave me no doubt of the better adaptability of the latter, though it was left to the slower operations of the regular survey to map out the difference more closely.

Arriving at the little town of Vijia Funte, on the right bank of the

Atrato, I made arrangements to embark the next morning in a large canoe, better adapted for a trip that was to last several days.

Traveling in a narrow canoe, when prolonged beyond a few days, becomes painfully laborious; even more so than a march of a corresponding distance, because one is obliged to remain in a cramped position during the day, and at night his rest must be on the split-palm floor of a native's hut.

Progress up stream is necessarily slow, and therefore there is no time to waste in putting up a tolerable shelter for the night. Propelled by the vigorous thrust of the Atrato canoe-men, and by making an early start, we averaged about thirty miles per day. Such a rate would not be possible against the current of the Atrato River, which averages from one to two and a half miles per hour, did not the boatmen avail themselves of slack-water and eddies by keeping the canoe close to the bank; and with long forked poles, called *poleneos*, it is pushed up stream, using only the paddle to direct its course. It required three days and a half to reach Quibdo, a distance of one hundred and twenty miles above Vijia Funte.

We were most hospitably received, the whole population turning out *en masse* to see *los Americanos del Norte*, their curiosity intensified to see the men whom, in their ignorance, they supposed were to build the canal at once and make Colombia the first country and Quibdo the chief city of the world, as they fondly hoped.

Two days were spent at Quibdo for a much-desired rest, and we left on our return, drifting down with the current, taking soundings every five minutes, while the traverse of the river was taken at the same time by angling between the points and noting the time of passing, the velocity of the current being found by experiment. The Atrato was found capable of ship-navigation but a few miles above Vijia, but navigable for the largest steamboats within two miles of Quibdo, where occurred the first approach to a rapid, the river spreading out with but three feet in the channel.

Our return was not marked with any particular event, and we reached the Tuscarora after an absence of nearly three weeks.

The exposure incident to so long a journey in an open canoe, together with the unhealthy condition of the Atrato Valley, caused both myself and Lieutenant Collins to be taken with a severe attack of fever, which incapacitated us for some weeks. In my absence the valley of the Murindo had been surveyed by Lieutenant Hubbard.
last bench-mark of party No. 3, which had been ordered in. This would give me three different lines of level to determine the height of the junction of the Napipi and Doguado, run by separate observers, and would prove a most excellent test of the general accuracy of the survey.

After these orders were carried out, Lieutenant Eaton was directed to bring his party back over the old Napipi trail to Limon Bay.

All the operations of the survey centering at Chiri-Chiri Bay, where the Tuscarora had removed since February 1, having been finished, we sailed for Limon Bay and arrived at our old anchorage of 1871.

Party No. 2 having completed the work above assigned them, returned to the ship at Limon Bay April 17, after an absence of seventy days.

This was the last party in the field, and their return completed the survey for this section of the Isthmus.

The survey of the Bojaya exhausted the limit of profitable territory to be explored for a ship-canal, and there now remained no portion of the Isthmus, beyond what had been unvisited, of the Darien that oro-

graphically or otherwise presented any favorable features; the Tuscarora accordingly returned to Panama, and the members of the expedition returned to the United States.

EXAMPLE OF ACCURACY OF THE SURYEY.

The position and height of the junction of the Doguado and Napipi has been determined by three separate parties, on three different lines, and affords a good illustration of the accuracy of our work.

One line by Lieutenant Collins, from Limon Bay and down the Napipi from its head-waters, gave an altitude of 140 feet.

One by Lieutenants Collins, Eaton, and Sullivan, from Chiri-Chiri Bay across to the Turcundo, down this river and the Cuia, across the Cuia to the Napipi, up the latter to the mouth of the Doguado, gave 136.5 feet.

One down the Doguado from its head-waters to its mouth gave the height of the latter 132 feet.

Here are three lines embracing nearly sixty miles of leveling, run by different parties, of a rough and mountainous country, and having an extreme difference of 8 feet. The mean, 136 feet, was taken for the true height, as shown on the profile.

The position of the same point as established by these separate parties did not vary but 1,000 feet, a hardly appreciable quantity on the map that accompanies the report of the expedition.

SUMMARY OF WORK PERFORMED BY THE DARIEN EXPEDITIONS OF 1870–1871, AND 1873.

In the northwestern portion, all the country contiguous to and the valleys of the following rivers have been surveyed either with the spirit-level or closely recorded observations of mercurial barometers: Mandinga, Samagundi, Necalagua, Carti, Centisiuegua, Bayamo, and Marmoni.

Hydrographic survey of the Gulf of San Blas, and Bayamo or Chepo Rivers to junction with Marmoni: In Central Darien, by same process, what is known as Cullen or Streim route, being the same as reported upon by Gisborne; the Caledonia or Aglamate; Aglasanigua River, called the Washington, to the mouth of the Alga; the Sassardi, Morti, Sucubti, Chucunaqua, Savanna, and Lava Rivers.

Hydrographic surveys of Caledonia and Sassardi Harbors, and Savanna and Lava Rivers: In Southern Darien, the river Atrato, from Quibdo to sea, two hundred and eighty miles. The river Tanela, known as De Puydt route. What is known as the Gorgoza, Lachaune, or Tuyra route, comprising Tuyra, Paya Cue, Terculegna, Cacurica, and Peranchita Rivers; also the valleys of the Napipi, Daguado, Murindo, Turcundo, Cuia, and Bojaya Rivers.

Hydrographic survey of Darien Harbor, Gulf of Darien, known as Columbia Harbor, and Chiri-Chiri Bay: Astronomical points were established on the Atlantic coast at Aspinwall, Cape San Blas, Isla del Oro, (Caledonia Bay,) Isla del Muerto, (Darien Harbor.) Pacific side: Panama, Chiprgana, and Purogana.

In the survey of the above, the following table will indicate concisely the amount of work performed each year:

Year.	Miles measured.	Miles leveled.	Miles surveyed; estimated.	Miles leveled by barometer.	Miles of line established.	Points established in triangulation.	Miles of lines of sounding.
1870.....	342	211	311.5	57	123.5	134	790.8
1871.....	32	61	81	81	100	50	260
1873.....	120.3	96.3	110.7	14	10	15	45
Total....	494.5	368.3	503.2	152	233.5	199	1095.8

DESCRIPTION OF THE PROPOSED CANAL ROUTE VIA THE NAPIPI AND DOGUADO VALLEYS.

Much has already been said of the nature of the country, and the difficulties to be encountered in the valley of the Napipi, in my previous report. But as the value of this route depends so entirely upon the capacity of ship-navigation of the river Atrato up to the point we leave it and cross to the Pacific Ocean by an artificial cut, I will again allude to it before proceeding to discuss the general features of the new proposed line.

Our knowledge of the Atrato is based upon a complete line of soundings run by Commander Lull the whole distance from the mouth of the Napipi to the mouth of the Atrato. For the whole distance from the Napipi to the ocean there is not so much as a rock or hill to be seen on the banks of the Atrato, a sufficient evidence of the alluvial nature of the country through which it flows, and a sufficient explanation of its great depth, now known for the first time, which seems to open to us a comparatively easy solution of the problem of a ship-canal.

No one who has visited this river and floated upon its surface as I have can but be struck with the grandeur of this mighty flow of water, and can but feel that it has been designed by the Almighty to bear a more important part in the great economy of the world's progress than the carrying of the little crafts which are now its sole navigators.

That the Atrato is entirely and wholly capable of ship-navigation to the point to which we wish to leave it, is a fact that no longer admits of any doubt.

From ocean to ocean, then, the only barriers are the half-mile of sand-bar at the Atrato's mouth, and the twenty-eight miles intervening at the mouth of the Napipi, between the Atrato and the Pacific, through which an artificial cut or canal must be made.

BAR OR OBSTRUCTIONS AT THE MOUTH OF THE ATRATO.

The Atrato spreads itself out into a delta at least twenty miles in length, and empties itself by thirteen mouths into the sea.

The great difficulty that has been met in the permanent improvement of the mouths of all the rivers that empty into the Gulf of Mexico is the shifting character of the sands, caused by the action of the sea-swell, and which require the constant use of the dredge, while a storm of a single night may open a channel entirely different from the one in use.

While nearly all the mouths of the Atrato are exposed to this same influence, that one known as the Uraba is an exception, as it empties

into an almost land locked harbor, the surface of which is hardly ruffled. This fact gives the character of its bar a permanence which none of the others possess in the same degree. Specimens of boring at a depth of 18 feet below the surface indicated that it is composed entirely of a black and white sand, whose geological proportions are the same as the hills from which the tributaries of the Atrato flow.

I was also struck by the fact that, as soon as we crossed the bar to a point where the overflow was restrained by the growth of plants, then did the depth commence to increase, and as soon as the flow was confined by banks compact enough, to sustain vegetation, the water at once deepened to five fathoms. This action of nature, in my mind, was conclusive proof that, if the current was confined by artificial banks and the inclosed distance dredged to the required depth, that there would be a permanent channel, requiring no further outlay to keep open.

From the ten-fathom line to a depth of five fathoms, in the Uraba branch, it is about 2,500 feet. There would be required for a double row of piling the whole of this distance 10,000 trees 30 feet long and 1 foot or more diameter. Trees of the variety known as the Cedron Guallaco or Triintago, Chacajo, and Insivé, can all be cut on or near the Atrato and its tributaries. These varieties are all hard and very durable, of a specific gravity less than water, and could be therefore floated to the desired spot and driven at a cost not exceding $5 per pile.

For a channel 300 feet wide and a depth of 26 feet of water, there would require to be removed 640,000 cubic yards of material. The expense, therefore, of the required improvement at the mouth of the Atrato may be summed up as follows:

10,000 piles, at $5 each	$50,000
640,000 cubic yards material, at 50 cents per cubic yard	320,000
	370,000
25 per cent. increase, for contigencies	92,500
Total	462,500

FROM THE MOUTH OF THE NAPIPI TO THE PACIFIC.

The new proposed route for the canal, as surveyed in 1873, embraces a portion of the same line as surveyed and reported upon in 1871. It starts from the Atrato, about three miles below the mouth of the Napipi, and runs almost due west, and never at a distance of more than half a mile from the river till near the mouth of the Doguado. Up to this point there are no rivers to cross, and but four small hills, none over 60 feet in height. The canal then bends with a gentle curve toward the river, and crosses the Napipi just below the junction of the Doguado. It follows close to the right bank of the latter, in a general southwest direction, and enters the Pacific Ocean at the mouth of a small stream called the Chiri-Chiri, which gives the name to the bay which will form the western terminus.

The total length of the whole is twenty-eight miles. That portionof, the line that follows the valley of the Napipi has been already described and it is only necessary to remark that as a locality there could be nothing better desired, being one continuous plain with a gradual rise of 90 feet.

From the mouth of the Doguado the country continues flat for two miles, with a gradual rise of 60 feet. We now strike broken country, with here and there small hills, increasing in height to 400 feet at about three and a half miles from the Pacific, at which point the tunnel com-

mences and is continued for three miles, passing under the divide, which is about 660 feet above the sea. Beyond the western end of the tunnel, we have the valley of the Chiri-Chiri.

The head-waters of the Doguado is a charming country, embracing a large extent of table-land, well watered and timbered, and abounding in game. Here will be a beautiful and healthy spot for the hospitals, swept by rarefied breezes at an elevation of 600 feet above the sea.

HARBORS.

The magnificent harbor at the mouth of the Atrato, named by the expedition Columbia Harbor, has already been described in a previous report. Ten miles deep by five wide, with a uniform depth of ten fathoms, completely land-locked and easy of access, it has no superior.

On the Pacific the western terminus is on the bay of Chiri-Chiri. It is open to the west and southwest, but its shores are bold and clear of reefs, and has good holding-ground of clay in 20 fathoms about three-fourths of a mile from the beach.

To protect the mouth of the canal from the ocean-swell I propose to construct two short breakwaters. Their cost will be but trifling, because they will be made of the *débris* dumped from the western face of the tunnel, which will be the easiest and cheapest way to get rid of it.

An American sailor who had lived many years on the coast told me that he had never seen it blow on the sea so heavy but that our ship, the Tuscarora, could have laid at single anchor; that he never knew of any gales, but that there were in the fall some squalls from off the land from the north and northeast.

LENGTH AND DIMENSIONS.

As has been said, we use the Atrato River, which is free from all obstructions, except the bar at its mouth, for one hundred and fifty miles. The artificial cut, or canal, to be excavated is twenty-eight miles in length; of this twenty-two miles are over a plain, three miles of moderately deep cutting, and three miles of tunneling.

The dimensions of the proposed canal are a depth of 25 feet, and a width at bottom, of earth, of 50 feet, and in rock of 60 feet, giving a working surface width of 70 feet, which is about the size of the Suez Canal; the sides sloping in earth, 2 horizontal to 1 perpendicular, and in rock, 1 horizontal to 4 perpendicular.

The tunnel will be 112 feet high and 60 feet wide, leaving 87 feet in the clear above the water-surface.

Three sidings will be constructed six miles apart, 2,000 feet in length, for vessels whose size will not permit them to pass each other on the canal.

Four plans of construction are proposed, as follows: Plan A, as given in the profile, with a summit-level of 120 feet, requiring altogether twenty locks; plan B, with the same summit-level, but with the bottom of canal carried but 15 feet below the grade-line, the required depth obtained by embankment 12 feet high; plan C, with a summit-level of 80 feet, requiring twelve locks; plan D, which contemplates a through cut from the Atrato River, in which case the canal would be filled from the latter river, and but three locks required at the Pacific terminus.

The only advantage of the latter would be the superabundant supply of water and the saving of time in passing through the locks; while on the other hand it would be more expensive, would not permit the

draining of the canal if desired for repairs, and, moreover, being necessarily very much below the bottom of the Napipi, would have to receive the surface drainage of the country through which it passed, which in the rainy reason might become a very great objection.

For myself I prefer plan B, as presenting the minimum of cost, and the moderate number of locks would add but little to the time necessary to pass from ocean to ocean.

The proposed size of the locks are a total length of 427 feet and a width of 54 feet, giving a clear length of 400 feet and a lift of 10 feet.

WATER-SUPPLY.

The water to fill the canal will be drawn entirely from the Napipi River, which at the summit-level will include also its two principal tributaries the Murindo and the Doguado Rivers. Its volume has been carefully, measured by cross-sections, and its flow at the point at which it will be tapped was about, April 1, 520,000 cubic feet per hour, which date may be considered the close of the dry season, as the rainy season commences during April and continues till the middle of June. From the marks on the trees indicative of high water, and an estimated velocity of two miles per hour, the volume of the Napipi at its highest stage is calculated to equal 8,000,000 cubic feet per hour. We are safe in allowing an average flow through the year of 3,000,000 per hour.

The survey across the country, which included a line of levels from the Cuia River to the Napipi, demonstrates that an aqueduct but three and a half miles long is necessary to utilize the flow of the Cuia, which in the dry season amounts to 450,000 cubic feet per hour, and which united with the Napipi will give a total supply of 23,280,000 cubic feet per day. This is a quantity far in excess of the demand required for a tonnage of three times the present amount that is estimated will use the canal, after making a liberal allowance for leakage, &c.

Should the time ever come that it would become necessary to build extra pairs of locks to accommodate a traffic beyond the resources of the canal to transport, we have the large river Opogado, which is about ten miles distant from the Napipi.

Experiments for evaporation at the mouth of the Atrato gave an average amount of about one fifth of an inch every twenty-four hours. This is a much smaller quantity than has been allowed in northern climates, but the difference is easily accounted for in the constant moist condition of the atmosphere of the Atrato Valley.

It is certainly a curious incident that the amount of evaporation as found in Captain Shufeldt's report upon the survey of Tehuantepec should have been found to be 0.19 of an inch, but 0.01 inch different from that obtained by our experiments; and therefore the evaporation in the tropics may be accurately set down at not more than two-tenths of an inch.

As will be seen farther on, in the construction of this work, after passing the first lock up to which the back-water from the Atrato will flow, the canal will be cut entirely through rock, care being taken to keep the bottom at such a distance below the grade-line as to accomplish this. On this account there can be no loss from filtration, an element in most canals that absorbs a large fraction of the water-supply.

The class of vessels that will frequent the canal are mostly of a large size. But the locks as proposed are long enough to take in at once two ships of 1,000 tons register each, one astern of the other.

Twenty lockages a day will represent a tonnage of 20,000 tons, pro-

vided each lock is filled by one or two vessels equal to 2,000 tons register; or during the year a total of 7,300,000 tons, which is three times the amount that it is calculated would at present use the canal.

With thirteen hours' daylight, and supposing that three lockages can be made in an hour, 40 lockages will represent the total amount that the canal is capable of accommodating. This would represent a carrying capacity of the canal for the year of 15,000,000, or six times the present amount of trade.

Therefore there is no doubt for the present, or at the time the canal is completed, but that the flow of the Napipi alone would be sufficient to supply the canal.

We have, therefore—

FLOW OF THE NAPIPI.

	Cubic feet.
Close of dry season	520,000
	24
Supply for twenty-four hours	12,480,000

DEMAND.

Leakage, at 3,000 cubic feet per minute	4,320,000
Evaporation, twenty-four miles of canal	288,000
Waste	1,000,000
Twenty lockages a day, equal to 20,000 tons per day	4,611,600
	10,219,600
Supply	12,480,000
Excess	2,260,400

Applying the total capacity of the canal, which, for reasons above stated, cannot probably exceed 40 lockages, through both summit-locks, we have a total:

	Cubic feet.
Forty lockages	9,223,200
Leakage, &c	5,608,000
	14,831,200
Napipi and Cuia Rivers combined flow at close of dry season	23,280,000
Excess	8,448,800

With these results there can be no doubt of a sufficiency of water for every requirement of the canal upon this route.

For the purpose of collecting the total flow of the Napipi in twenty-four hours when necessary, and to more quickly fill the summit-locks, a reservoir, of a capacity of 20,000,000 cubic feet, will be constructed between the canal and Napipi above the summit-level.

COST AND EXCAVATION.

For the purpose of obtaining the exact amount of excavation, from which can be calculated a close estimate of cost, we divide the work into four divisions, which are subdivided into twenty-seven parts.

The area of the prism at the end of each part is calculated, and the mean taken, which is multiplied by the length of the part in feet, to obtain the cubical contents. Theoretically this is correct, but practically it will give too large a quantity; but this is preferable to having too small an estimate, and allows for irregularities of ground.

To obtain the total cost of the excavation of the canal we allow 33

cents per cubic yard in earth, $1.25 and $1.75 per cubic yard in rock, and $5.35 for tunnel-work.

These estimates of cost have been furnished me by Benjamin H. Latrobe, esq., the distinguished engineer of the Baltimore and Ohio Railroad, and are believed to be fully equal to the necessities of the case.

It is proposed to employ almost entirely coolies or Chinese labor, Though the Chinese cannot do as much per capita as northern laborers, they work with more steadiness, and they could be procured, clothed, and fed at a cost not exceeding $16 per month. The Chinese are extremely quick at learning, and very shortly they would be equal to skilled labor in the handling of mining implements. They are now employed in large numbers upon the railroads of Peru and Costa Rica, and make, I am told, excellent miners, of which nature most of the work upon the canal partakes.

PLAN A.

Division No. 1.—This extends from the Atrato River to the summit-level, or from A to T, a distance of 103,900 linear feet, or about 19.7 miles, and includes eight locks, six of 10 feet, and two of 11 feet lift. This division will require a total excavation of 5,328,493 cubic yards of earth, and 7,801,998 of rock.

5,328,493 cubic yards of earth, at 33 cents	$1,758,403
7,801,998 cubic yards of rock, at $1.25	9,752,498
Estimated cost of single lock, $175,000; 8 locks	1,400,000
Total	12,910,901

Of the above estimated cost of a single lock, $50,000 are for gates and machinery. This division is excavated as far as B in earth, the remainder in soft rock and earth. The deepest cut will be 56 feet, and the average about 35 feet.

Division No. 2.—It extends from lock No. 8 to east face of tunnel, or from T to *T*, a distance of 25,640 feet, or about 4.9 miles, in which there are to be excavated 691,329 cubic yards of earth, and 4,937,619 cubic yards of rock. Owing to the harder character of the rock, and the deeper extent of the cut, the cost per cubic yard is increased to $1.75 per yard. We have, then, for total cost of this division—

691,329, at 33 cents	$228.139
4,937,619, at $1.75	8,640,833
Total	8,868,972

The deepest cut in this division is at the east face of the tunnel, and amounts to 223 feet, the least 35 feet; but the average depth will not exceed 75 feet.

Division No. 3.—This division is a tunnel 5,233 yards in length, a fraction less than three miles. Its dimensions are 112 feet in width; its sides are perpendicular for 63 feet, and the remaining 49 feet an arch. The number of square yards in a linear yard are 633.

In estimating the cost of this work, supposing the rock to be self-sustaining, I have allowed a cost of $5.25 per cubic yard. Adding to this 25 per cent. additional, as shown in the general summing up, it would give $11 per cubic yard for the first 40 feet in height, and $500 per yard for the running rectangular space—an ample sum, when compared with the cost of tunnels now under construction. The total cost of division No. 3 amounts to $17,731,232.

I have already spoken at length in my previous report of the popular prejudice against tunnels, and there is little now to be said. Tunneling is becoming now a general resort of engineers; and with the improved power-drills, and enormous force of nitro-glycerine, it is no longer looked upon as a subject to be avoided.

The very size of this ship-canal tunnel is in its favor, as the work will cost less, yard for yard, than railroad work, from the increased facilities that its dimensions give in removing the blast.

There would be three shafts probably sunk, giving eight faces to work upon, whose united length would not exceed 962 feet.

It should not be forgotten that this feature of a tunnel will permit the excavation of the most costly portion of the line to be carried on uninterruptedly, day and night; while, on portions of this or any other canal constructed in the tropics, much delay and annoyance will be caused by the great rain-fall of the wet season.

Division No. 4.—This division, which terminates at the Pacific, or from A to C, is 4,400 feet in length. There will be required about 67,882 yards of earth, and 395,993 rock, of excavation. It includes the system of twelve locks, and which would follow one immediately after the other, and possibly one of them might have to be placed in the mouth of the tunnel.

Nothing more than an approximate estimate can be given for the cost of the locks in this work. But as they are excavated in the solid rock, of which the cost is allowed, the greater portion of the expense will be in the gates, machinery, gate-walls, and miter-sills. Blocks of concrete or béton can be substituted for dressed granite at much below the cost of the latter, and it is believed the sum allowed for the locks will cover their cost.

Cost of Division No. 4.

67,882, at 33	$22,401
395,993, at $1.25	494,991
12 locks, at $150,000 a lock	1,800,000
Total	2,317,392

Total divisional cost.

Division No. 1	$12,910,901
Division No. 2	8,868,972
Division No. 3	17,731,232
Division No. 4	2,317,392
Total	41,828,497

To utilize the whole daily discharge of the Napipi in the dry season it is proposed to construct a reservoir to hold 20,000,000 cubic feet. This would require an excavation, supposing the banks raised 10 feet above the surface, 1,000 feet long by 800 feet broad, and 15 feet deep—a total of 440,000 cubic yards, which, at $1.25 per yard, would give as cost of reservoir, $550,000.

An aqueduct to connect the Cuia and Napipi Rivers would be 6,060 yards in length. Allowing $100 per linear yard for excavation and piping, it would give cost of aqueduct, $606,000.

Five hundred thousand dollars are allowed for culverts; one million dollars for construction of a narrow-gauge railroad to be used in the transportation of supplies, and as a tramway to remove the *débris;* also for the purchase of the necessary steamers on the Atrato, which would

not probably exceed two in number. One million is also allowed for the crossing of the Napipi River by the canal, and the necessary sluice-ways and conduits to the reservoir.

We have, therefore, the following—

SUMMARY OF EXPENSES.

Cost of excavation	$41,828,497
Cost of reservoir	550,000
Cost of aqueduct between Cuia and Napipi Rivers	606,000
Cost of culverts	500,000
Cost of railroad, narrow gauge	1,000,000
Crossing the Napipi River by canal	1,000,000
Grubbing and clearing	500,000
Sea-wall, Chiri Chiri Bay	200,000
Wall, Atrato River and eastern mouth of canal	25,000
Executive department	120,000
Engineer department	375,000
Pay department	90,000
Quartermaster's department	135,000
Commissary department	120,000
Hoisting and pumping engines	875,000
Medical department	80,000
Improvements at mouth of Atrato River	462,500
Twenty-five per cent. added for contingencies	12,116,749
Total	60,583,746

The above amount placed to the credit of the medical department is too small. But there will probably be a yearly revenue of $50,000 from rents of land and buildings, which would be appropriated to the support of the hospitals.

PLAN B.

This differs from the preceding so far that the bottom of the canal is carried but 15 feet below the grade-line, and embankments are formed on each side, some 15 feet high, to retain the waters of the canal; but this will only apply to division No. 1; the others necessarily remain an ordinary cut. In other respects it does not differ from plan A, except requiring one more lock.

The advantage of this plan is the minimum of cost of division No. 1, which by this method amounts to $3,891,609; or, applied to the summary of expenses as given under plan A, would place the total cost of the canal at $53,937,247.

PLAN C.

This plan employs but four locks to the summit level, and eight locks down.

Its advantage is in tapping the Napipi River lower down and having an increased supply of water, and less delay in passing through but half the number of locks.

The excavation will be necessarily much greater, and the tunnel will be 1,900 feet longer than by plans A and B.

The Napipi will yield, at the point tapped on this plan, 200,000 cubic feet per hour more than when taken as in plan A. The total cost of excavation will amount to $64,220,670, and total cost of canal in this plan will be $72,518,795.

PLAN D.

This differs from all the above in the fact that it purposes to do away altogether with locks, except the three at the western terminus, to

equalize the difference of level between the Atrato, at the point the canal leaves it, and the Pacific Ocean. It will be, therefore, a straight cut and filled from the Atrato, which has a volume in the dry season of at least 1,600 cubic feet per second.

Necessarily the excavation will be larger and the tunnel will be increased 3,900 feet, making the whole length of tunnel 3.71 miles.

The cost of excavation by this plan will amount to $81,815,320, and total cost of canal as an open cut will amount to $90,113,445.

HEALTH.

The health of the expedition of 1873 has been unexceptionably good. There were a few cases of intermittent fever, but they yielded readily to treatment.

But one man connected with the survey was lost, and he by drowning in the Atrato.

Though the work of the survey of the Isthmus of Darien has been of the most arduous nature, and necessarily required constant exposure, yet on all the expeditions, extending through three years, not a man has been lost by climatic causes, nor have the personnel of the expedition returned with impaired health.

Experience and observations have taught me that Europeans of regular habits, and abstemious in their diet, with the proper care of wearing light woolen clothing next to the skin, can live many years on the Isthmus of Darien without permanent injury to themselves.

It is a satisfaction to know that the Isthmus of Darien is no longer a doubtful land. That as far as its adaptibility for a ship-canal, that it has been thoroughly explored.

The United States has now, through the various expeditions fitted out for the purpose, the whole data to decide upon the feasibility of a project that has been the dream of centuries; and the best location for an enterprise the greatest and most important the world has yet seen.

To show the vast commerce that will flow through it, and the saving of time and distance over the old routes of Cape Horn and Cape of Good Hope, the following tables are given, as called for from the Secretary of the Treasury, by the House of Representatives, in February, 1872:

Trade of the United States with the following countries.

Countries.	Entered.		Cleared.		Total.	
	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
West coast of Mexico	60	20, 554	72	30, 853	132	51, 407
West coast of Central America	29	5, 626	19	4, 210	48	9, 836
West coast of South America	148	193, 393	132	166, 055	280	339, 448
Sandwich Islands	59	32, 819	69	40, 822	128	73, 641
Islands Pacific	7	1, 537	4	757	11	2, 294
Australia, New Zealand	83	64, 604	50	28, 839	133	93, 443
China	90	60, 658	43	38, 084	133	98, 742
Japan	47	30, 200	19	13, 300	66	43, 500
Dutch East Indies	23	12, 908	14	13, 565	37	26, 473
California*	100	100, 000	108	130, 022	.....	230, 022
Total tonnage from the United States through canal						969, 006

* For year ending June 30, 1873.

Trade of Great Britain for 1870 *with the following countries.*

Countries.	Entered.		Cleared.		Total.	
	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
United States Pacific coast*	150	308, 625	.....	70, 639	.....	379, 264
West coast of Mexico	15	5, 572	4	1, 057	19	6, 629
West coast of Central America	19	8, 196	13	6, 368	32	14, 564
Islands of the Pacific	18	15, 580	5	1, 846	23	17, 426
Chili	146	86, 281	212	125, 264	358	211, 545
Peru	257	224, 131	139	114, 589	396	338, 720
Equador	6	1, 970	6	1, 768	12	3, 738
Japan	8	3, 667	53	33, 148	61	36, 815
Australia and New Zealand	243	220. 889	338	320, 872	581	541, 771
Total tonnage from Great Britain through canal						1, 550, 472

* For year ending June 30, 1873.

Total tonnage of Germany with above countries	146, 049
Total tonnage of France with above countries	169, 259

Total tonnage that would use the canal:

United States	969, 006
Great Britain	1, 550, 472
Germany	146, 049
France	169, 259
Total	2, 834, 786

In the above estimates no account is taken of the trade of Great Britain with China and East Indies, much of which, outward bound, would seek the canal.

Comparison of times and distances between the old routes, via Cape Horn, and Cape of Good Hope, and the Isthmus of Darien.

TABLE FOR STEAMERS.

From—	To—	Time.	Distance.	Remarks.
		Days.	*Miles.*	
New York	Sidney	40	9, 970	
Do	Hong-Kong	48	12, 165	Via Honolulu.
Do	Manila	47	12, 005	Do.
Do	Shanghai	46	11, 605	Do.
Do	Yokohama	43	10, 675	Do.
Do	Batavia	51	13, 000	
Do	Honolulu	29	7, 155	
Do	Callao	15	3, 500	The same time and distance on the return passage.
Do	Valparaiso	21	5, 000	
Do	San Francisco	25	.....	
RETURN.				
Sidney	New York	42	9, 970	
Hong-Kong	do	46	11, 735	Great circle route.
Manila	do	48	12, 325	Do.
Yokohama	do	43	10, 315	Do.
Honolulu	do	29	7, 300	
Batavia	do	54	13, 120	

SAILING-VESSELS.

Outward.

Present route.				Via canal.		Gain.	
From—	To—	Distance.	Days.	Distance.	Days.	Distance.	Days.
		Miles.		*Miles.*		*Miles.*	
New York	Hong-Kong	14,930	110	12,480	83	2,450	27
Do	Shanghai	15,200	115	12,200	81	3,000	34
Do	Yokohama	15,750	119	11,550	79	4,200	40
Do	Manila	13,700	108	12,260	80	1,440	28
Do	Batavia	12,170	105	13,425	87	.....	18
Do	Sidney	12,220	105	10,480	75	2,740	30
Do	Valparaiso	9,760	93	6,510	52	3,250	41
Do	Callao	11,100	105	6,710	53	4,390	52
Do	Honolulu	14,500	121	7,400	54	7,100	67
Do	San Francisco	14,840	130	7,470	58	7,370	72
				Return.			
Hong-Kong	New York	14,660	110	11,875	87	2,785	23
Shanghai	....do	16,000	113	11,305	80	4,695	33
Yokohama	....do	16,070	114	10,370	77	5,700	37
Manila	....do	14,010	109	12,035	88	1,975	21
Sidney	....do	13,410	110	10,390	70	3,020	40
Valparaiso	....do	9,780	90	4,965	42	4,815	48
Callao	....do	11,120	100	3,690	32	7,430	68
Honolulu	....do	15,760	110	8,055	63	7,705	47
San Francisco	....do	14,970	125	5,980	50	8,990	75

In conclusion, it is a pleasure to recommend to the favorable notice of the Department Lieutenants Collins, Eaton, and Sullivan, who volun teered to accompany me on the present expedition.

The frequency with which their names appear on the pages of these reports indicates the positions of honor and trust which they have so worthily filled, and is the best evidence of the zeal and ability which they have always displayed.

To Commander Belknap and officers of the Tuscarora I am indebted for valuable assistance and co-operation, without which it would have been impossible for me to have carried on the survey.

Trusting I have met with the expectations of the Department in the execution of the original orders to survey the Isthmus of Darien for a ship-canal, delivered to me in January, 1870, I have the honor to be, sir, very respectfully, your obedient servant,

THOS. O. SELFRIDGE,
Commander, United States Navy.

Hon. GEO. M. ROBESON,
Secretary of the Navy, Washington, D. C.

No. 13.

NICARAGUA EXPEDITION.

WASHINGTON, D. C., *October* 25, 1873.

SIR: I have the honor to submit the following report of the work performed and the result obtained by the United States surveying expedition lately operating in Nicaragua:

The following naval and civil officers were attached to the expedition, viz:

Naval officers.—Commander Edward P. Sull, commanding expedition; Lieutenant Commander G. C. Schulze, Lieut. Wm. W. Rhoades, Lieut. Eugene H. C. Leutz, Lieut. Jacob W. Miller, Lieut. Jefferson F. Moser, Master John M. Hauley, Master J. B. Briggs, (United States steamer Kansas,) joined the expedition April 9; Master K. Niles, Ensign Jas. H. Bull, First Asst. Engineer Geo. M. Greene, Asst. Surg. John M. Bransford, Commander's Clerk Augustin S. McCrea, jr.

Civil officers.—Chief civil-engineer, A. G. Menocal; civil engineer, J. Foster Crowell; mineralogist, J. E. Cropsey; draughtsmen, A. Pohlers and W. V. W. Reilly.

In addition to these there were attached to the expedition several young men, with petty-officers' ratings, detailed for duty as rod-men, chain-men, and pole-men.

The following instruments and other articles of outfit were either on hand or provided, viz:

Instruments, &c.—Two engineers' transits, three levels, two gradienters, two surveyors' compasses, two delicate pocket aneroid-barometers, four mercurial mountain-barometers, one boring-apparatus for testing excavations, one current-meter, surveyors' chains and pins, watches, pocket-compasses, sounding leads and lines, drawing instruments and materials, field-glasses, &c., transit and level books, sounding-books, and necessary stationery, &c.

General outfit.—Axes, hatchets, machetas, shovels, and picks; camp-kettles and frying-pans; and for each officer and man one shelter-tent, one India-rubber blanket, one knapsack, one haversack, one canteen, one pair of leggings, one hammock, and one mosquito-net.

Five months' provisions for sixty men were prepared, put up in packages of from 35 to 60 pounds each, and so securely as not to be liable to injury from exposure to heat and moisture, and consisted of the following, viz: bacon, soup and boulli, tomato-soup, hard bread, rice, beans, sugar and coffee.

The instructions of the Department, issued in February, 1872, to Commander A. F. Crossman, and, after the death of that officer, carried out in part by Commander Chester Hatfield, required an exploration within the limits of the State of Nicaragua, to discover if possible a practicable route for an interoceanic ship-canal.

GEOGRAPHICAL DESCRIPTION.

Nicaragua, in shape a quadrilateral of very unequal sides, lies between latitude 10° 40′ north and 15° 20′ north, and between longitude 83° 00′ west and 87° 40′ west. Lake Nicaragua lies in the southwest part of the state, is about ninety miles long, and from thirty-five to forty-five miles wide. It is separated from the Pacific by a narrow strip of land at one place, viz: between Virgin Bay and San Juan del Sur, but twelve miles wide. To the northward and westward of Lake Nicaragua, with a surface-level from twenty-two to twenty-eight feet higher, lies the smaller Lake Managua, connected with the former by the Rio Tipitapa, through which, however, there is no visible flow of water at the present time, though Lake Managua has no other outlet. Lake Nicaragua discharges its waters through the river San Juan, which, leaving the lake at its southeast extremity, flows in a generally east-southeast course to the Caribbean.

The Cordillera is divided in the northern part of the state. One

branch, extending to the eastward, sends its multitudinous spurs to the coast and to the banks of the San Juan, while the other, passing to the westward of the lakes, sinks in some places into a mere range of hills. This is particularly the case near Leon, and again near Rivas. The bulk of the population and wealth of the country is in the departments bordering upon the Pacific.

The valley of the San Juan is entirely uninhabited, with the exception of the little villages of San Carlos and Castillo Viejo, clustering around the forts of the same names, and here and there a small plantation or a wood-chopper's station. Fort San Carlos is at the outlet of the lake, and Castillo Viejo some thirty-seven miles down the river, abreast the second rapids, to which, as well as the village, it gives its name.

THE PROBLEM AND ITS SOLUTION.

A glance at the map will show that any project for a canal through Nicaragua must involve the lake of the same name, not only because its water is needed at the summit-level, but because it lies in the narrowest part of the country, measuring from sea to sea.

It is quite clear that a line, more or less practicable, exists between the lake and the Caribbean, following the valley of the San Juan, and that this line is not only the lowest, but the shortest, which does exist between the two; the shortest, because the lake shore approaches nearer the coast at its outlet than at any other point, and the lowest, because if any other existed lower or as low, then would there be another outlet. This line, however, would be of no value unless a practicable line also existed between the lake and the Pacific. The attention of the explorer is therefore naturally first turned in that direction. Fortunately a great deal was already known in regard to that part of the country; and at least one line, *i. e.*, that from the mouth of the Rio Lajas to Brito, surveyed in 1850–'51 by Col. O. W. Childs, had been reported upon very favorably. The first work done by Commander Hatfield's party was, in accordance with the Department's directions, to re-survey this line. Child's description was found to be correct in the main, and his route was ever after taken as a standard of comparison for all others.

Commander Hatfield also examined, and found impracticable, the line starting from the mouth of the Rio Sapoa, ascending to the divide by the valley of that river, and terminating in Salinas Bay, on the Pacific; this line is generally regarded as the boundary between Nicaragua and Costa Rica. He had also partially examined a line indicated by Colonel Sonnenstern, the State Engineer of Nicaragua, following the valley of the Ochomogo, and having for its objective point on the Pacific the mouth of the Rio Escalante. The Ochomogo empties into the lake some thirty miles north of the mouth of the Lajas. The advent of the rainy season prevented Commander Hatfield's completing the work here, and also prevented the examination of another line to which his attention had been directed, in the immediate vicinity of Child's route, and which it was hoped would prove superior to it.

SAILING OF THE EXPEDITION.

The expedition of the present year sailed in the United States steamer Kansas, Commander A. V. Reed, from Hampton Roads, Virginia, on the 3d of December, 1872, and arrived off Greytown, (or San Juan del Norte,) Nicaragua, December 20. We succeeded in landing without

accident, and proceeded, as soon as possible, to Virgin Bay, to complete the work on that side of the lake. Arriving January 3 at Virgin Bay, we found Midshipmen Keeler, Winslow, and Hughes, United States Navy, who had been left with a steam-launch and a few men to do some hydrographic work in the lake, as the calm weather of the rainy season was particularly favorable for it. These young officers were under orders to the United States, to be examined for promotion, and we were thereby deprived of their services, which would have been very valuable.

COMMENCEMENT OF OPERATIONS.

Two parties had been organized before reaching Virgin Bay, and were ready to go into the field at once. They consisted of the following, viz:

Party No. 1.—Lieut. E. H. C. Leutze, in charge; Civil-Engineer J. F. Crowell, in charge of the transit instrument; Lieut. Jacob W. Miller, in charge of level; four petty officers; rod-men, pole-men, chain-men, &c.; one seaman; two Caribs.

Party No. 2.—Lieut. William W. Rhoades, in charge; First Assistant Engineer George M. Greene, with the transit instrument; Lieut. Jefferson F. Moser, with level; Mr. J. E. Cropsey, mineralogist; four petty officers; rod-men, pole-men, and chain-men; three seamen.

In addition to these there were required for each party twelve natives to be employed as macheteros or choppers, muleteers, and cooks. These, with pack and saddle mules, were obtained without trouble, through the kind offices of Messrs. Pedro and José Chamorro, leading merchants of Rivas; one an ex-senator, the other an ex-minister of finance of the state. Through the kindness of these gentlemen we were saved much trouble and delay in obtaining help and in supplying our other needs, and I shall ever hold them in grateful remembrance.

Don José Chamorro was, shortly after our arrival, specially commissioned by his government to aid us, but it was impossible for him to do more than he had already been doing voluntarily.

To Lieutenant Rhoades's party was assigned the work of examination of the route already referred to, which it was hoped would prove to be superior to that of Childs's. This line began at the north of the Rio del Medio, followed up its valley, crossed the divide, and descended to Brito by the valley of the Rio Grande; a small portion of it coinciding with Childs's line.

Lieutenant Leutze's party was directed to complete the examination of the Ochomogo line. Master K. Niles, with three men, was sent to Brito to establish a tide-gauge.

An American gentleman, Mr. Ran Runnels, formerly United States consul at San Juan del Sur, but now residing at Virgin Bay, kindly placed at our disposition a cottage which he owned, to be used as a store-room, draughting-room, and quarters for officers; while the cuartel, or barracks, was given to us by the agent of the government as a hospital, &c. We fortunately had but little use for it in that capacity, however. To Mr. Runnels and his estimable family we were, and had been since the landing of the first expedition, constantly indebted for hospitality and assistance of every kind in their power. The commanding officer accepted an invitation to become their guest, and received every kindness and attention which their thoughtfulness could devise. They will long continue to occupy a warm place in the heart of every officer in the expedition.

Lieutenant-Commander Schulze, the executive officer, was placed in

charge of the commissariat, as the keeping up of supplies required one of the most experienced officers. The commanding officer and the chief civil engineer were left free to move from party to party as occasion demanded.

The parties began work January 7; party No. 2 establishing their bench-mark at the lake-level, party No. 1 taking up the line on the Ochomogo, at the point where it was abandoned the previous year. Observations were taken daily at a lake-gauge at Virgin Bay, to show the amount of fall in the level of the water.

As the medio-line gave great promise at the outset, party No. 2 were directed to make their survey with great care and with considerable detail. The traverse was run with an engineer's transit and chain, and cross-sections were taken at every 500 feet, extending 500 feet either way. The levels were taken at every 200 feet or less. In the party operating upon the Ochomogo, a surveyor's compass was substituted for the transit; in other respects the instruments were the same. The line being less promising, and, in fact, scarcely promising at all, a close reconnaissance, rather than a detailed survey, was required. A few days served to show that this line was altogether impracticable. The level had reached 87 feet above the lake, although the end of the traverse was still at a distance of some miles from the divide. Reconnaissances were made in several directions by Messrs. Leutze, Menocal, Miller, and Crowell to find a lower pass than that they were now approaching, elevations being carefully measured by the aneroid barometer. It was found that the lowest pass was 225 feet above the lake-level, with a long slope on either side, making a very bad profile. There was, of course, no need of further examination. The line was accordingly abandoned, and the party removed to the banks of the Rio Gil Gonzales, some eighteen miles south of the Ochomogo, and whose valley was the only other locality where there was a possibility of finding a practicable route.

I might here add of the Ochomogo line that it had merely been indicated by Colonel Sonnenstern, as one of the localities which should be examined.

In the mean time party No. 2 were making excellent progress, the line developing well, and, except that it was longer than had been expected, (the lake-shore lines not having been correctly laid down on the maps,) it was proving quite as good as had been hoped.

On the 15th of January Colonel Sonnenstern, by order of his government, joined the expedition, giving us from that time till we left the country the benefit of his thorough acquaintance, not only with the territory but the people, and also of his personal services at all times when needed.

EXAMINATION OF NAPOLEON'S ROUTE.

Louis Napoleon, while a prisoner at Ham, wrote a pamphlet, in which he indicated a route for a ship-canal, which, after reaching Lake Nicaragua by the Valley of the San Juan, ascended by the Rio Tipitapa to Lake Managua, leaving which at its northwestern extremity it continued to the port of Realejo. The only object in carrying the line in this direction was to secure the harbor of Realejo as the Pacific terminus, opposed to which advantage were the disadvantages of the greater distance and the difference of level of the two lakes. The Department, in its instructions, deemed it proper that such examination should be made of this line as should show whether or not its advantages outweighed its disadvantages.

As the parties were now well under way with their work, the commanding officer, with Mr. Menocal, Colonel Sonnenstern, and Mr. Hawley, set out to make a reconnaissance covering the route just described. At Granada we were met by Mr. Hollenbeck, an American merchant doing business in Greytown, and president of the Nicaragua Steam-Navigation Company, (whose vessels navigate the San Juan and Lake Nicaragua,) and who, for his own purposes, desired to go over the ground which we proposed to examine.

The expedition had already been indebted to Mr. Hollenbeck for many favors, and he now added to these by offering us the joint use of a small metallic life-boat, which we gladly accepted. Mr. Hawley was seized with a sharp attack of fever, and was unable to proceed.

Colonel Sonnenstern, with our horses and mules, went by land to the head of the Lake Managua, where he was to indicate a landing by erecting a signal. The rest of us, embarking in the life-boat, proceeded to the Estero of Panaloya, sounding as we went; through the Estero to the river Tipitapa, ascending the latter until the rapids (so called, for no water flows over the rocky bed) were reached; then putting the boat onto an ox-cart, which we found at the hacienda of Pasquiel, we sent it to the upper lake; at the same time making a paced traverse from the spot where the boat was hauled out to where it was again launched, and measuring the difference of levels between the two lakes by aneroid barometers—one observer remaining at the level of the lower lake, and the other going to that of the upper one, so that we had simultaneous observations at the two points.

Embarking again, we continued our line of soundings to the head of Lake Managua, where we joined Colonel Sonnenstern, having been three days and a half on the way since leaving Granada. Colonel Sonnenstern now showed us all the low passes from the lake toward the coast, and a careful examination was made of each of the heights, being measured as before by simultaneous pairs of observations, one observer at the water's edge, at the lake side, and the other going over the line. The conclusions arrived at were as follows, viz:

To carry the canal through Lake Managua and on to Realejo or to the Gulf of Fonseco; first, there would have to be dredged a channel at least sixteen miles in length from deep water in Lake Nicaragua to the foot of the rocky portion of the Rio Tipitapa, the depth of water being now, on the average, 10, and in the deepest places but 12, feet; thence an independent canal of four miles, with three locks to lift from the level of Lake Nicaragua to that of Managua, there being a difference of level varying from 22 to 28 feet between the two lakes. Next a channel two miles in length to deep water in Lake Managua, to be dredged, the water now gradually deepening in that distance from 4 feet to 5 fathoms.

From Managua City to the western end of the lake the cordillera extends in an unbroken wall, gradually lessening in height from about 1,200 feet till it looses itself in a high plain.

Several lines were run from the lake shore to a distance of from three to five miles, leading as has been said, through the passes indicated by Colonel Sonnenstern. We found long gradual slopes with heights varying from 80 to 200 feet above Lake Managua, which of course gave, taking the mean difference of level between the two lakes, from 105 to 225 feet above lake Nicaragua, nor were we quite sure when the lowest of these levels was found that the summit had been reached.

The least distance from the lake to Realejo is some thirty miles, so that even if the profile were much better than it is, the line bears no comparison with Child's route on account of the distance alone, with-

out considering the six additional locks, three ascending and three descending, required. We found one other objection, which would of itself be fatal to the line; the geological formation of that part of the country is entirely volcanic. A line of volcanoes, nine in number, and all more or less active, extends from the lake towards Realejo, nearly parallel to, and in close proximity with, the proposed line of canal. While writing these pages news comes of the outburst of one of them, Monotombo, (whose base is washed by the waters of the lake,) accompanied by a shock of earthquake which was felt slightly as far as Virgin Bay, a distance of eighty miles. The soil and the underlying rock are so extremely porous that even in the wet season no streams flow into the lake from that side, all the rain that falls being drank up by the earth. We examined all the wells that we met, and found them from 100 to over 300 feet deep. If a canal were built through this region it would be impossible to keep it full unless it were made artificially water-tight from one end to the other, which would involve a cost equal to that of the excavation. For all of these reasons we regard the route as utterly impracticable.

In a survey made by Mr. John Baily many years since, that gentleman professed to have found a pass with but 56 feet above the lake level, but the most of his statements are found to be entirely unreliable, and this is no doubt like the rest. For example, he finds Lake Nicaragua to be 121 feet above mean tide in the Pacific, while the true difference of level is but 107 feet. Many of his other statements have been proved to be equally incorrect.

One valuable discovery resulted from our reconnaissance, which was the existence of a lime-stone quarry near Tipitapa, from which a high order of natural hydraulic lime is produced.

Returning by land, we stopped for a couple of days at Managua. We made an official visit to the president, who expressed great interest in the enterprise in which we were engaged, and offered on the part of his government all the assistance in its power. This offer we found the authorities everywhere not only instructed but fully disposed to make good, while the people, particularly the more intelligent classes, were equally well disposed towards the expedition.

While at Managua we were visited by several of the ministers of state, senators, members of congress, and other prominent gentlemen, and were serenaded by the national band, under the immediate direction of the president of congress, who was accompanied on the occasion by the minister of foreign affairs.

We were enabled on our way back to obtain a great deal of useful information in regard to the country and its resources.

On arriving at the Rio Gil Gonzales, we found that Lieutenant Leutze's party had demonstrated the impracticability of the line following the valley of that river, and on our entering their camp we met Messrs. Leutze and Crowell returning from the last of several reconnaissances which had been made by themselves and Mr. Miller, to find a practicable pass across the divide.

The Gil Gonzales, before reaching the lake, loses itself in a swamp, which, though it gave encouragement in one sense, promising comparatively low ground, made it extremely laborious to get the levels and traverse to the lake. After this was accomplished, however, the work became comparatively easy, though the elevation rose quite rapidly, and soon proved that no practicable line was to be found, though, of course, it was not abandoned until each of its tributaries had been followed up to an inadmissible altitude. There being no other locality

not already known, which gave any promise, the party was ordered in to headquarters, while we proceeded to visit Lieutenant Rhoades. We found that his line had reached within four miles of Brito, and had developed as well as had been hoped for it. The officers and men, like those of party No. 1, were all well, though nearly everybody in each party was suffering with innumerable itching sores, upon all parts of the person, produced partly by dietetic, and possibly by climatic causes, but mainly by the bites and stings of insects and the poisonings of different vines and plants; principally among the former were the *garapatas*, a vicious species of wood-tick, which swarm almost every leaf and plant growing near the ground, and are of every size from that of a pin-point to that of a large split pea; transferring themselves by thousands to one's clothing and thence to the person, they bury their heads under the skin and are extremely hard to rid of. Frequently beating the clothing with a switch will rid one of a great many of the little pests, but it was seldom that any one passed a whole day without finding a greater or less number upon his person. Although the region in which the parties were operating contained several estates more or less cultivated, yet by far the greater part of each line was through an unbroken virgin forest, the rank tropical vegetation in many places forming a perfect jungle; occasionally were met large areas filled with the terrible pica-pica, as it is called by the natives; it is a tall bush loaded with a kind of bean, whose pods are covered with a down consisting of minute barbed needles; these are detached from the bush at the least shake given to it, and alighting upon the person produce perfect torture, seeming to penetrate through the clothing as easily as into the unprotected parts of the skin; the sensation produced is exactly like that of fire. It was sometimes found impossible to cut through the pica-pica at all, and slight deflections of the line were caused by it several times. It is only at certain seasons that the pica-pica is so troublesome, and our parties unfortunately experienced it at its worst.

On the 15th of February Mr. Rhoades's party reached Brito, and Mr. Greene and Lieutenant Moser connected their traverse and levels, respectively, with Mr. Niles's tide-guage.

A few days were then spent in making detailed surveys of some particular localities. The traverse as already examined having been plotted, and the proposed line of the canal laid down on the map, it was found that it would be necessary, if possible, to turn in four or five places the channel of the Rio Grande, and also that particular information was needed at two or three other points, for which purpose the special surveys were directed. At the same time Mr. Hawley, with a few men, was sent with the boring apparatus to test the character of the excavations likely to be met.

A party consisting of Lieutenants Leutze and Miller, Mr. Crowell, Mr. McCrea, and three men, was also sent to run the levels between Lakes Nicaragua and Managua, in order to ascertain the exact difference of level.

By February 22 all the parties had returned, having completed their work, and preparations were made to transfer the expedition to the valley of the San Juan. For reasons which will be given under the appropriate head, the route just surveyed and known as the Rio del Medio line was regarded as showing a better combination of favorable conditions than any other line, and to be entirely practicable, not only in an engineering but also in a commercial sense.

On applying to the Messrs. Chomorro for the amount of the indebtedness of the expedition for the hire of men, animals, &c., I was informed

by them that they had been directed by the government of Nicaragua to pay on its account all expenses for such objects incurred by the expedition; this very handsome offer I did not feel at liberty either to accept or decline, without communicating it to your Department. In answer to my communication, I was directed to decline the offer with the Department's thanks, not only for that, but for all the assistance which had been given us by the government and authorities of Nicaragua. This order I communicated to the minister of foreign relations, who caused it to be published in the official gazette.

Our friend Mr. Hollenbeck having been notified that we were ready, sent the lake steamer to Virgin Bay for us; we embarked in her and proceeded to the mouth of the Zavalo, a tributary of the San Juan, which it joins just above Toro Rapids. Arriving March 4, 1873, we named our encampment "Camp Grant."

Although the river San Juan had several times been surveyed with more or less care, the surveys had always been confined to the river proper, and previous to our visit nothing was known of the adjacent country beyond what could be seen from the river banks. When it is considered that there is seldom a spot where the eye can penetrate two rods' distance, it will be seen how extremely limited the information was.

The Department's instructions required that the river should be examined with a view to such improvement, wherever possible, as should fit it for ship navigation, and that a location should be sought in its valley for an independent canal between those points where it should be found that the river could not be used.

GENERAL DESCRIPTION OF THE SAN JUAN RIVER.

Descending the San Juan we find it a broad open river for twenty-eight miles, when we reach the first, called the Toro Rapids; these are some two miles long; next we have a stretch of clear river for seven miles, then the second or Castillio Rapids, less than a quarter of a mile in extent, and taking their name from the fort upon an adjacent hill; seven miles farther we reach the Mico and Balas, coming so close together as really to form continuous rapids; their extent is not quite one mile; four miles farther down we come to the Machuca Rapids, the last which we find; their length is about two miles.

For twenty miles from the foot of Machuca the river has a depth varying from 20 to 60 feet, with but little current; this section is called by the natives Agua Muerte, or dead water. At the foot of the Agua Muerte, the San Carlos is received into the river, and is the first considerable tributary met; above this, although every valley has its little stream, often deep enough to give a good wetting to our parties, yet the most of these are insignificant. The Zavalo and the Paco Sol are the largest of the upper tributaries, but have but little effect upon the main river. Opposite and below the mouth of the San Carlos, which comes from a long distance up in the Costa Rica hills, the San Juan changes its character altogether, and is filled with shoals and sand-bars. Twenty-four and a half miles below the San Carlos is the confluence of the Serepiqui, a river of similar character and size, and also coming from Costa Rica. Thirteen miles farther, we come to the forks of the Colorado; here the main river divides into two branches, the principal of which, the Colorado, flows to the eastward and empties into the sea; the less, called the Lower San Juan, passes more to the northward, and is divided up into numerous mouths, one of which, the Tanso, dis-

charges its waters into the sea, the others into the lagoon which was once the harbor of Greytown.

About four miles above the forks, a small caño, called the San Juanillo, leaves the main river and flows in a direction generally parallel to the lower San Juan, which it finally rejoins near Greytown.

Most persons who are acquainted with the tropical regions agree in the opinion that, as a rule, slack-water navigation in tropical streams is almost if not quite impossible, on account of their being subject to sudden and violent freshets. The San Juan having its origin in a body of water of so large area as Lake Nicaragua, and being fed, as said above, by insignificant tributaries in its upper portions, is not there subject to these freshets. Below the confluence of the San Carlos, which drains a large extent of mountainous country, the San Juan partakes of the character of other rivers in the same region; farther on it will be seen that we propose the use of the river only above the mouth of the San Carlos, and an independent canal from there to the sea. At the present time the freshets of the San Carlos, by backing up the waters of the San Juan, affect the rises in the latter even as high as the foot of Machuca Rapids. This backing up will, however, be entirely overcome by the dam, which is estimated for, to be located just above the mouth of the San Carlos.

A rapid examination of the river, made while on our way to Virgin Bay, had convinced us that the navigation from its head to Castillio Rapids could be so improved as to fulfill the conditions required; it was therefore determined to begin at the latter place the survey for an independent canal-route.

The organization of parties Nos. 1 and 2 continued pretty much as before, except that Master Hawley took the level in Lieutenant Leutze's party, relieving Lieutenant Miller, who was placed in charge of a separate party to make a survey of the river proper. Master Miles, Ensign Bull, and Mr. Brown, a young English gentleman, who accepted the vacant position of first-class apothecary, were assigned to Mr. Miller's party as assistants.

Colonel Sonnenstern was the bearer of instructions from the government to Colonel Sandoval, commandant of the fort of Castillio, to let us have as many soldiers as could be spared from duty to act as machetoros. Colonel Sandoval was able to let us have but eight men, just half as many as we needed, and after trying in vain for nearly a month to get more, either on the river or from Greytown, Colonel Sonnenstern went to Granada, where he procured a full supply. In the mean time the parties had to work short-handed, adding no little to the severity of the labor.

The section of the country adjacent to the river, between the Castillio and the Machuca Rapids, is exceedingly broken, many of the mountain spurs extending to the very water's edge. This section of the work bid fair to prevent more difficulties in locating a canal, and consequently required a more careful examination than any other. I concluded to keep the two parties together until past Machuca, giving to Mr. Rhodes's party the main line, and to Mr. Leutze's the special surveys of the several rapids, and of the probable locations of dams; and also the running of offsets from the main line to the river bank.

It will be seen further on how admirably, upon the result of the survey of this section, the engineering skill of Mr. Menocal has solved that part of the problem which gave us most discouragement while the survey was progressing.

The country was so much more broken than had been supposed that

a canal built through it would be enormously expensive, while it seemed as if the improvement of the river would be still more so. A happy combination of the two methods, however, has overcome the difficulties, and the section, instead of being the most expensive and troublesome, bids fair to be the least so.

A bench-mark was established on the left bank of the river about one-half mile above Castillio Rapids, and the work was fairly begun on the 6th of March. The parties made their first encampment in some farm buildings, but ever after had to rely upon their shelter-tents. These were of very light canvas, water-proofed, and afforded very fair protection from rain. Officers and men soon became so skillful in building houses with these that they were able to make themselves comparatively comfortable.

The line led through an unbroken virgin forest, so interlaced with parasites and undergrowth as to be almost impenetrable, and in most places altogether so without the vigorous use of the macheta, making it necessary to cut a trail for every foot of advance, passing sometimes three or four times a day over hills of greater or less height and through streams in every valley. Although at this season of the year we had reason to expect the dryest weather, scarcely a day passed without one or more showers, which converted the overlying stratum of clay into a stiff, clingy mud, particularly upon the hill-sides, where it was less covered with vegetable deposit. The labor upon the west side of the lake had seemed to be, and was, very severe, but it was looked back upon as very light in comparison to what was now endured, more particularly as the parties, always organized with the minimum number consistent with efficiency, were now, as has been mentioned, short, one five men and the other three. I might mention that no servants were allowed to officers, from commander down, as the small appropriation made it necessary to economize in every way possible. Indeed, after leaving the vicinity of Castillio Viego, the officers were obliged even to wash their own clothing, being out of the reach of anybody who could be hired for the purpose.

It would be impossible for me to express my appreciation of the untiring energy and zeal displayed by both officers and men, and of the cheerfulness with which they submitted to the hardships and discomforts of the seventy-six days spent in running the line to Greytown.

A general compass-course was taken from the map, and followed as nearly as the conformation of the ground would permit; constant reconnaissances on either side being made to take advantage of any low ground, which by diminishing the profile would compensate, or more than compensate, for the increase in length caused by deflections. This required a great deal of judgment, and was usually done by Mr. Menocal when present, and at other times by the officer in charge of the party, though there was ample employment for the latter without this extra duty; in fact it would always be better to have at least four officers in each party, so that when the officer in charge was absent upon a reconnaissance there would be another to lead the line without calling the officer in charge of either the transit or of the level to divide his attention between that duty and his own.

Mr. Menocal remained with party No. 2 until the line reached Machuca, and was indefatigable in his labors, saving many a mile of useless work by examining the country ahead of the instruments, though with every precaution the line would occasionally get into a nest of hills and spurs impossible to pass, when it would become necessary to retrace a greater or less distance and take a new departure, a most disheartening opera-

tion to a party with a long distance ahead and a limited time to accomplish it in.

With every exertion, under the existing circumstances, a mile a day was good progress, while in some few cases of unusually rainy days not more than 2,000 feet were made.

The line was so near the river that it was always convenient to locate the camps on its banks. This was a fortunate circumstance, as the only means of transportation was by boats or upon men's shoulders. A flat-boat, lent to us by Mr. Hollenbeck, and a large canoe, were used for shifting camps, which was done whenever the line extended so far that it was inconvenient to walk back at night. At first a new camp was made for about every four miles of survey, but later not more than one for each eight miles, the new camp always being carried some distance ahead of the end of the line.

The Messrs. Hollenbeck, Runnels, and Chomorro, and Colonel Sonnenstern under his familiar title of "Don Max," were all remembered in giving names to the encampments.

After a few days at the level, Mr. Hawley was taken with a severe attack of fever and obliged to give up; he was, however, sent to Greytown to relieve Mr. Reilly in charge of the bulk of our provisions which had been left there in store. Requisition was made upon Commander Reed of the Kansas for another officer and also for five seamen; in the mean time Lieutenant Leutze took charge of the level in addition to all his other duties. About the same time Lieutenant Commander Schulze was prostrated by a sunstroke, and so severe was the shock upon his system that the surgeon advised his being sent north as the only chance of recovery. Messrs. Schulze and Hawley had been a great deal in the West Indies of late, both serving in the first two expeditions under Commander Selfridge in Darien; neither was in a fit state of health to go on the present expedition, and we were deprived of the services of two experienced and zealous officers at at the very time when they were most needed. Mr. Hawley was very useful in his new position, however, which compensated largely for his loss in the field.

While the topographic parties were progressing toward Machuca, Lieutenant Miller made his preparations for beginning the survey of the river proper, fitting out for the purpose a little flotilla consisting of a flat-boat borrowed of a Colonel Hanger at the mouth of the Zavalo, a dinghy belonging to the Kansas, a balsa designed by Commodore Ammen, United States Navy, and a canoe; the flat-boat was designed to carry provisions and equipments, and also to be used as quarters for the officers and part of the men, and was fitted up with awnings and bunks; the rest of the men lived in the other boats.

The survey of the river was directed to be done with the gradienter, an instrument combining the functions of the transit and level, and also fitted with a micrometer-attachment, by which distances are obtained by measuring the angle subtended by a rod upon which two triangles are fixed 12 feet apart. The level was to be run from the lake to Castillo, where it was to be connected with Mr. Moser's initial bench-mark, in order that we might have a connected line of levels from the lake to the sea. On the 29th of March an officer came up the river from the Kansas with five seamen, two of whom were sent to Mr. Leutze, and the other three to Mr. Miller, making his party complete. About the same time Colonel Sonnenstern arrived from Granada with a number of natives, who were distributed between the two topographic parties, making them also of full strength.

In the hydrographic party the following distribution of work was made: Lieutenant Miller, with the balsa, took charge of the gradienter, recording the courses and distances and sketching in the topography. Master Niles, with the dinghy, took and recorded the soundings. Ensign Bull, with the canoe, took charge of the level and gradienter rods, and recorded the levels.

The work was done as follows: A bench-mark was established at the water's level on the wharf of the Navigation Company, at San Carlos; the rods were sent to the bench-mark, the gradienter set up, and back observations taken for course, distance, and height of instrument. The rods were then sent to the opposite bank of the river and somewhat down stream, where four observations were taken for course, distance, and height of station. Next, the instrument was carried down a convenient distance, but on the same side of the river, and back-sights were again taken as before. A line of soundings was run from instrument-station to rod-station, and thence to the next instrument-station, and so on. Mr. Browne, with the flat-boat, dropped down each day to a point abreast the last station, where a convenient place on shore was sought for building a fire, and the cook set to work to prepare dinner. By the time that was accomplished, which was generally about sunset, the boats were anchored in the middle of the river, to avoid as much as possible the mosquitoes, which came out in swarms as night approached. Dinner dispatched, all hands were generally ready to spread their mosquito-nets and go to bed. Before daylight in the morning everybody was astir, breakfast and the midday luncheon were cooked at the same spot which had served the night before, and the traverse was again started.

From San Carlos to the mouth of the Zavalo, the banks of the river are low and swampy, though the water was at about its lowest stage —earlier in, the work could scarcely have been done at all—heavily fringed with grass, and overgrown with trees, brush, and parasites. The last are always particularly luxuriant near the water, and assume the most fantastic and often beautiful shapes, forming screens and bowers of dense foliage of all colors and varieties, very charming to the eye, though anything but agreeable to those who have to cut through it to find a setting for an instrument or rod and an outlook to the opposite bank, and who often find themselves covered with ants and other insects by the time they have finished.

The topographic parties reached Machuca April 2. It was now determined to divide the remainder of the work into two sections, giving to Lieutenant Leutze's party the line from the mouth of the river Serepiqui to Greytown, and to Lieutenant Rhoades's that from Machuca to the initial point of Mr. Leutze's section.

Mr. Leutze and party, accompanied by Mr. Menocal, started in the flat-boat on the 3d and arrived on the following day at the Serepiqui, established their camp some two miles below its mouth, and commenced their line at once.

On the 9th of April Master J. B. Briggs, of the Kansas, joined Mr. Leutze, and was placed in charge of the level.

My first intention had been to run the line for a canal continuously from Castillo to Greytown, leaving it to be decided afterward how much of it should be used, and how much of the river itself, a little further examination convincing us that with slight improvement the Agua Muerte could be made fit for ship-navigation; and the time being very limited I determined to let Mr. Rhoades bench off where he now was, April 16, about four miles below Machuca, and to recommence

opposite the mouth of the San Carlos, directing Mr. Miller on his arrival to take up the level and connect Mr. Moser's two bench-marks.

By April 19 Mr. Rhoades and party had established a camp and commenced their new line.

At a good stage of water the river-steamers run from Greytown to the foot of Castillo Rapids, around which the cargoes are shifted by a tramway to another boat which carries them above the Toro Rapids, where they are again shifted to the lake-steamer. As the dry season advances the river-boats are first prevented from going nearer to Greytown than the forks of the Colorado, and soon after are unable to go above Machuca Rapids. A small flat-bottomed steamer of about fifteen tons burden is then brought into requisition to navigate the rapids, and even she has great difficulty in doing so. This state of affairs occurs at the very time when the freights on the lake and river are heaviest; when the coffee and indigo crops are being moved, together with large quantities of India rubber and hides. No little nerve is required in navigating the rapids at this season of the year, as the tortuous channels make it very dangerous to property if not to life. The river is strewed with the wrecks of steamers that have been lost in the last twenty years. Without the constant personal exertion of Mr. Hollenbeck, the steam-navigation company would have been brought to a stand-still this year; and as it was, on account of the necessarily irregular trips of the boats, it became sometimes a difficult matter to keep our parties supplied with provisions, though Mr. Hollenbeck did everything in his power to aid us. I was obliged, on one occasion, to carry a load to Mr. Rhoades by canoe, a distance of sixty miles, against the strong current of the river, arriving just in time to save the party from being out of almost everything.

Lieutenant Miller's party reached the head of Toro Rapids with their survey by April 26, after which, the river-banks becoming higher and firmer, they commenced to have somewhat easier work per mile, but compensated for it by making more miles a day.

We were now beginning to experience the weather that we had expected earlier in the season, showers becoming more rare day by day, contrary to the predictions of the inhabitants, who had expected an early return of the wet season. All the parties were in consequence making exceptionally good progress, and were straining every nerve to complete the work before it should be interrupted by the rains.

Mr. Rhoades's section between the San Carlos and Serepiqui was developing very favorably for the canal, but was passing through a great deal of swamp, which made the work very severe; indeed, had it not been for the very dry weather it would have been impossible, in many places, for Messrs. Green and Moser to set up their instruments at all. The party were availing themselves of the sand-banks left dry by the falling waters as locations for camps. These were very pleasant, being clear and free from vegetation, while the breeze had free access, making them much cooler than while surrounded by trees; but to pay for these every officer and man suffered more or less from the inigua, or jigger, as it is sometimes called, and the mosquito-worm. These, or rather their germs, are both deposited under the skin by insects, the former generally located in the feet, where the young are developed in large numbers inclosed in a sack. If these are not extracted or destroyed they produce ugly sores. The most of us before leaving the country became quite skillful in removing them, and following the native rule of putting a little of the ash or juice of tobacco in the cavity which had been occupied by the sack, none of our number suffered any ill consequences from

them. The mosquito-worm is much more troublesome. It attacks all parts of the person. The worm grows rapidly, and its gnawing is quite painful. The method used by the natives to extract it is to lay over the skin, for a few minutes, a piece of tobacco saturated in oil, after which it can generally be squeezed out without trouble. Calomel instead of tobacco is more efficacious still, and will sometimes succeed when the other fails. Mr. Greene removed two by it from his head where they had been annoying him for several days. The theory is, that the tobacco or the calomel makes the worm come to the surface.

I was never able to discover exactly what insect it was that produced either of these. The jigger is supposed to be deposited by a small sand-fly, and the worm, as its name indicates, by a peculiar kind of mosquito.

Insects, lizards, &c., had been so common from the first that the most of them had ceased to be annoying. Mosquitoes at night, and in the swamps at all times; and by day wasps, hornets, and congo-flies, particularly a large yellow species, which drew the blood every time it alighted upon the skin; no one could become enough used to it to produce indifference; our parties had plenty of opportunity if it had been possible. Garapatas, though not uncommon, were so much less plentiful than they had been on the west side as not to be taken into account. On the other hand mosquitoes which, except in the swamps, had never troubled us there, were here in countless swarms. Another of the pests of nearly every camp was the alligator-ant, which attains a length of nearly an inch, and whose bite is as painful as the sting of the hornet, and apparently even more poisonous. Hartshorn was always carried by some member of the parties as a remedy for bites and stings. Among the many favors which had been bestowed upon us by Mr. Runnels and his family, of Virgin Bay, was a present to each officer of a cedron-bean, said to be a certain remedy for the bites of venomous snakes or the sting of tarantulas; fortunately we never had occasion to test its merits, though there were many narrow escapes. Parasite vines of all sizes and colors, and festooned in every imaginable form, were so common that a snake hanging from a limb of a tree would often be unnoticed by the officers and sailors, though never by the macheteros, who seemed to be on the constant lookout for them. Occasionally one of the former would suddenly feel himself seized and jerked back, and would find that the keen eye and the strong arm of one of the natives had rescued him from an enemy that he himself had not seen, though perhaps looking directly toward it and not a yard from it.

Toward the last of April, Mr. Leutze's line had reached the San Juanillo, and was extending down its valley toward Greytown; the ground was very swampy, with heavy cutting, while the river itself at its head was impassable even for the smallest canoe, being full of drift-wood, and at that season having scarcely any water. After extending the line some three miles from the main river, returning each night to the camp which was still on the banks of the latter, it became impossible to proceed farther without obtaining a nearer camping-ground, as the six miles' walk going and coming was a fair day's work of itself. As it was quite impossible to transport the camp equipage, provisions, &c., to the end of the line, even if there had been a suitable location for a camp, it was concluded to cut a trail through, striking the main river some distance lower down, (the two streams, near their forks, running at an acute angle with each other.) This picket proved to be over a mile long, passing over several steep-sided hills, fortunately none of them very high, and through swampy ground in their valleys. It was

some improvement in point of distance, however, and the camp was shifted down to where the picket struck the river-bank. The line was now extended some three miles farther on a compass-course, leading over hills, across runs, through swamps and mire, across several sloughs, and across three lagoons. Some of the streams could be forded, others had to be bridged by felling trees across them; logs had to be dragged and laid to make a footway across the sloughs, and generally the best that could be done made but a precarious one. Each time the party passed over the line it would be found that much of the work had to be done over again. The lagoons were overgrown with a tall, thick water-grass; this was beaten down until a sort of floating island was made, when by stepping lightly and quickly over it, the party succeeded in getting across, not without an occasional mishap attended with a good wetting and no little danger, as it was impossible to swim, and next to impossible for one to aid another.

It was hoped every hour as the line advanced that the San Juanillo would again be intersected and found navigable, when it was proposed to move the camp to its banks, by taking the boats down the lower San Juan to the junction, and up the former stream to the camping-place. After going about three miles, a sluggish stream flowing to the southward and eastward was crossed. According to the best maps in our possession this should have been the desired river; it was still too shallow for the boats, and too muddy to be waded; so full of logs and other obstructions that even if the bottom had been hard it would have been a tremendous task to follow its bed. There was nothing left to do but to try and strike the stream again, lower down. Lieutenant Leutze and Mr. Crowell, with the macheteros, now spent one day cutting a trail to intersect the river. A mile and a half was run, showing no signs of it, and finally coming into a nest of hills; the party now returned to the main line, and extended that for 3,000 feet, when the lateness of the hour compelled them to start for camp. The work accomplished, together with the walk from the camp and back, had made a very severe day's labor, but there was worse to come. Mr. Leutze now resolved to cut through on the compass-course which he had been following, until the river was reached, and to run the instruments over it afterwards. Accordingly, on the morning of May 3, he, with Mr. Crowell and the macheteros, set out before daylight. The end of the line was nearly five miles from camp, and the trail, made worse each time it was passed over, was exceedingly heavy. On reaching it the men were divided into two reliefs, and working an hour each at a time. The line was advanced 13,600 feet, passing for a couple of miles over the same swamp and mire, after which it intersected seven different hills, from 80 to 150 feet high, with very steep sides; then a valley was followed for some distance, whose water-course had to be forded in numerous places; next, a wide shallow stream was reached. This obstacle at first seemed insurmountable; the stream was too shallow to be crossed by swimming; its muddy bottom afforded no footing, and its width precluded the usual method of bridging by felling a tree across it. Finally all hands set to work to cut and bring branches. These were thrown into the water, and confined in place by logs until sufficiently firm to bear a man's weight; then some of the number occupying that which was already laid, built further in the same manner, till a sort of causeway extended from bank to bank. The party then crossed over, but so little sustaining-power was there in the structure that the last man was nearly up to his waist in water before he reached the bank.

The party now proceeded on a short distance farther, when they sud-

denly came out upon the shore of a beautiful lagoon. The map showed a nest of lagoons in the vicinity, all connected with the San Juanillo, but whether this was one of them or not could not be told. Hoping that it might be, a signal was erected at the end of the picket and the party turned their steps homeward. Mr. Leutze hung up his blue flannel shirt upon the signal to make it more conspicuous. They reached the camp some time after dark, some of the number so exhausted that it was feared they would not be able to reach it at all. The day had been intensely hot, the breeze being entirely cut off by the dense vegetation. Myriads of insects filled the air; the yellow congo and the mosquitoes seemed unusually vicious. The fifteen miles of tramping, wading, climbing hills, scrambling over fallen trees and through the jungle would have been a severe day's work, alone, without the additional labor of cutting and road-building.

The limits of this report make it impossible to give anything like a detailed account of the labors of the different parties or of individual officers, but the above will give an idea of them, though candor compels me to say that the last day here described never had quite an equal; indeed, a very few such would have broken down the strongest of our people. Throughout the expedition the officers not only directed but led the work, no matter how hard or disagreeable it might be, and were most cheerfully followed by the petty officers and seamen. Especially deserving of mention were Messrs. John Quevedo, Charles H. Mays, Paul Hoffmann, John Buck, Joseph C. Bruner, and Henry Butz, who enlisted with petty officers' ratings to do duty in the expedition as rodmen, polemen, and chainmen, and exhibited great zeal and intelligence in the performance of their duties.

A couple of days after the events above narrated, Messrs. Leutze and Crowell went to Greytown, where they procured the services of an excellent guide, well acquainted with the Juanillo lagoons, and who, from their description, recognized the lagoon which they had found as the Silico, named from the Silico palm which grows upon its borders: to this he guided them. The route led up the San Juanillo for about four miles, then through a small creek and into the lakelet; here, to their joy, the signal was found. A great many fallen trees, branches, &c., had to be cut away before even a canoe could be forced through the creek. They now selected a place for a camp and returned to Greytown. A couple of days later they had brought the party around, established themselves in their new camp, and set to work to run the instruments and chain over the trail which had been cut, as described. First, however, several reconnaissances were made to see if the seven hills could be avoided without too great deflection. It was found that they could not be, and the line was accepted as it had been orignally run.

May 13, the commanding officer, accompanied by Colonel Sonnenstern, went in the Kansas to Monkey Point, examining carefully the intermediate coast for harbors, or locations where harbors might be formed, making surveys of the angles in the shore-line at Punta Gorda and at Monkey Point to see if either of these could be utilized; both, however, proved hopeless for the character of harbor required for a canal terminus. The country between Greytown and Monkey Point was very broken, except the alluvial formation which extends only a little over one-half of the distance. Colonel Sonnenstern, who, in 1866, had passed over the route between San Miguelito, on the lake, and the mouth of the Roma River, had declared the country to be utterly impracticable even for a railroad, which was then projected; but, although having every confidence in the opinion of that gentleman, the commanding

officer thought it better to make such a personal reconnaissance in that direction as would fulfill the instructions of the Navy Department.

By May 22 all the parties had arrived in Greytown—the work in the interior complete. The weather for the last month had been magnificent, and more had been accomplished than during the previous two months. On the 20th the weather changed entirely, bringing heavy and frequent showers.

Several of the officers and men who had held out to the last day of the work, now, that the strain was relieved, were attacked with fever. Mr. Rhoades was among the number. None of the cases were at all serious, and were mainly due, probably, to overwork, and to sharp wettings during the last two or three days on the line.

There now remained only some hydrographic work to be done to supplement a survey of the harbor made the previous year, and to get the steam-launch down from the lake, the low stage of the water in the river not having permitted it before. As it was hoped that there might have been a rise, or soon would be, a small party under Mr. Leutze, accompanied by Mr. Browne, was sent after the launch. The commanding officer, Colonel Sonnenstern, and Dr. Bransford went up the river at the same time to attend to other matters, part of which was to pay off at Castillo the soldiers who had served as macheteros, and also deliver and pay for the use of some canoes which had been employed by the expedition.

In getting the launch over Tero Rapids, she was unfortunately grounded in about the worst part of it, involving two days' labor for all hands in the water. We even had the doctor overboard up to his neck; although this was not exactly in his department, the doctor was always ready for hard work when it could be made useful. The cultivation which Mr. Leutze and Mr. Browne had each given to his muscle worked greatly to our advantage also. Our friend Mr. Hollenbeck finally came to our rescue, after we had, with only partial success, exhausted our own means. Coming by in the steamer Panaloya, he tied her up to the bank, took our line to his capstan, and, after two or three hours' work, succeeded in getting the boat off. He then piloted her safely over the rapids through a channel known to himself.

At Castillo Mr. Leutze rigged sheers and hoisted out the launch's boiler, Colonel Loudoval with his soldiers, manning the falls of the tackle. Everything else was removed from the boat that could be, but as she still drew some four feet, it was found impossible to get her over the rapids. No rise had as yet taken place, though considerable rain had fallen. Mr. Hollenbeck promised to send the boat down the river by some of his people, as soon as there was a sufficient rise. We therefore left her in charge of a watchman, and returned to Greytown. On our arrival I found awaiting us orders from the Department, directing me to send a number of the officers home by mail steamer, and the remainder of the expedition by the Kansas. The former arrived in New York July 3, and the Kansas with her party, July 20. I am happy to say that not an officer or man was lost from any cause.

A full and detailed report is in course of preparation, with maps, plans, profiles, and diagrams, designs for locks, dams, culverts, &c., and for breakwaters and other proposed harbor improvements, with the estimated cost of each, and will all be forwarded to the Department as soon as completed.

The work was constantly checked as much as possible. So long a traverse required extreme care to prevent its swinging out more or less. As has been said, this work was immediately intrusted to Messrs. Greene

and Crowell, in the topographic parties, and to Mr. Miller, in the hydrographic. Offsets were frequently run from the main line to the river-bank, and were connected by Mr. Miller with his traverse. These gentlemen also sketched in the topography.

The levels from the lake to the sea, an aggregate distance of one hundred and nineteen miles, were run by three different officers, viz, Lieutenant J. F. Moser and Master J. B. Briggs, on the main line, with intermediate sections by Lieutenant Miller, upon the river-banks. These, compared with the line on the Pacific side, showed the height of the lake to be absolutely the same above mean tide of either sea. When the character of the ground passed over is considered, this coincidence seems quite remarkable, and shows with what extreme care the work was executed.

Too much cannot be said in praise of Lieutenants Rhoades, Leutze, and Miller, the commanders of parties, for the intelligence, judgment, and zeal with which they performed their multifarious and often perplexing duties. Lieutenant Miller speaks in the highest terms of his assistants, Messrs. Niles, Bull, and Browne.

Mr. McCrea, commander's clerk, volunteered for the duty of rodman, and continued to perform it until taken down with fever.

Dr. Bransford, in addition to treating the sick in the most successful manner, was indefatigable in collecting specimens of plants, animals, insects, &c., and in acquiring a knowledge of the peculiar diseases of the country, and what differences of treatment were found necessary in the case of the natives and of foreigners, for this purpose treating gratuitously all who applied to him. His report will doubtless be very interesting to medical men.

Mr. A. G. Menocol, the chief civil engineer, by his thorough knowledge of his profession and his constant personal exertions, as much as possible accompanying that party, who, for the time being, were operating in the most difficult section of country, contributed enormously to the success of the expedition. Indeed, with so able and zealous a set of officers there was but little left for the commanding officer to do except to keep the parties in supplies, and failure was impossible. I beg to add that these remarks are not made, as so often is the case, for the sake of saying something agreeable, but as giving expression to a conviction which was of great comfort to me during the progress of the work. As I could not be with each of the parties all the time, it was very pleasant to know that the work went on quite as well when I was not present as when I was, and possibly better.

THE PROPOSED CANAL AND IMPROVEMENTS.

The surface of Lake Nicaragua is 107 feet above mean tide in either sea. It is proposed to make this the summit level of the canal, and to connect the lake with the Pacific by canal, and with the Caribbean Sea by a combination of canal and slack-water navigation.

WESTERN DIVISION.

The first section of the proposed canal toward the Pacific leaves the lake at the mouth of the Rio del Medio, and extends for a distance of 7.58 miles, with an average depth of cutting of 54 feet. This section is by far the most expensive part of the whole work. The second section extends from the end of the first to Brito, a distance of 8.75 miles, making the total distance from lake to sea 16.33 miles. The line has been laid down

as nearly as possible to correspond to the lowest profile. It consists, however, of straight reaches and of curves which are arcs of circles. The smallest radius admitted is 2,200 feet. The excavation in the second section will be, throughout, less than the prism of the canal; in other words, the proposed surface is higher than the profile of the ground. The material taken out will be used to build up embankments. There will be ten descending locks, all in this section, and located in the straight reaches. There will be at Brito a tide-lock.

LAKE NAVIGATION.

From the mouth of the Rio del Medio to the head of the San Juan the distance is about 56 statute miles. Twenty-six feet of water can be carried to within 1,350 feet of the mouth of the Rio del Medio. On the east side a channel will have to be deepened from 6 to 8 feet for a distance of nine miles. The bottom is a firm mud, easily removed by the dredge.

EASTERN DIVISION.

SLACK-WATER NAVIGATION.

It is believed, for reasons which have already been given, that slack-water navigation in the upper part of the San Juan is entirely practicable.

It is proposed to improve the river by the construction of four dams, the first at Castillo, the second at Balas, the third at Machuca, and the fourth near the mouth of the San Carlos. Most excellent locations for dams exist and have been selected at the first three places, with solid rock foundations, shallow water, and a wide channel-way in proportion to the general width of the river, thus subjecting the dams to the minimum risk from the force of the water. The location at San Carlos would be called good, except in comparison with the others, which are exceedingly favorable.

Some improvement in the bed of the river will have to be made here and there by dredging and blasting out rocks. This has been estimated for, the amount of excavation being computed.

To get around the dams there will be required sections of canal of the following lengths, respectively, each containing one lock, viz, at Castillo, 0.78 mile; at Balas, 1.57 miles; and at Machuca, 1.16 miles.

CANAL.

From the mouth of the San Carlos to Greytown, a canal of 41.9 miles in length is proposed. This line has been laid down to correspond with the lowest profile, except when the increase of length required to make it do so was too great to be compensated for by the diminution in the depth of excavation. The curves, as in the western division, are all arcs of circles. The least radius is 2,500. The profile is so favorable that 36.96 miles out of the 41.90 will require excavation less than the prism of the canal, the material being used for embankments. The remaining distance is made up of several short reaches where the line cuts through hills.

Seven locks in addition to those abreast the dams will be required, making ten in all. These will be located in the hills just mentioned, in order to take advantage of the rock foundation, the advantage of which will be enormous.

The total length of canal will thus be 61.74 miles; of this, 47.37 miles will be in excavation and embankment combined, leaving but 14.37 miles in which the excavation is greater than the prism of the canal. 6.50 miles of the deep cutting is in one section, *i. e.*, in the first of the western division; the rest is composed of the cuts through hills and parts of the sections around the dams. In all cases on the east side there will be convenient places of deposit for the material taken out close at hand; where embankments are made the whole of the material removed will be placed directly abreast the place from which it is taken.

The eminent American engineer, Mr. J. C. Trautwine, estimates that where excavation costs 19 cents per cubic yard when deposited within 25 feet, it will, if carried one mile in carts, cost 57.09 cents, and if carried two miles, will cost 95.57 cents per cubic yard. This exhibit of the rapid rate of increase in cost will show how immense is the advantage in a work of such magnitude of having the place of deposit so close at hand.

It happens that the section of the western division requiring the deep excavation is located in the best cultivated part of the country and where there are most roads. A little exercise of judgment on the part of the person directing the work will enable him to get rid of the most of his material even there without carrying it any great distance. The crest of the divide is but a few yards wide and the descent is quite rapid on either side. By commencing the work at different elevations turnouts will be found near at hand.

In comparing the relative merits of any two proposed routes for a canal, nothing can be less satisfactory than the mere statement of their relative lengths without also stating the average depth of excavation; thus, were the sides vertical, then would a canal ten miles long, with an average depth of 40 feet, be equal to one twenty miles long, with a depth of but 20 feet; but, in fact, the banks must always have an outward slope, in order to be self-sustaining; the least slope admissible in canals of the character here considered is in earth 1½ feet to 1, or, as both sides are the same, the cross-section widens 3 feet for every 1 foot of increased depth. The canal here estimated for has an average depth of cutting of but 9 feet above the prism, or the proposed water surface; the 61.74 miles are equal to but twenty-two miles of one whose average depth above the water-surface is 40 feet.

In estimating the cost of the work, 35 cents per cubic yard has been allowed for earth, and from $1.25 to $1.50 in rock. In computing the amount of rock, care has been taken to allow for more than is likely to be met, in order to be on the safe side.

It will be seen that prisms of two different widths are estimated for, the reduced is proposed for those portions which require deep cutting, and, except that the proposed depth of water is one foot greater, does not differ materially from the dimensions proposed for the Darien Canal. The wider is proposed for all the rest of the canal, *i. e.*, for those portions where excavation and embankment are to be used. The difference in the shape of the prism for earth and for rock is due to the different slopes required.

DIMENSIONS OF CANAL PRISM.

Reduced.

	In rock.	In earth.
Width at bottom	50 feet.	50 feet.
Width 10 feet above bottom	90 feet.	
Width at surface of water	106 feet.	128 feet.

	Broad. Earth.
Width at bottom	72 feet.
Width at surface of water	150 feet.
Width 10 feet above surface	180 feet.

The depth of water throughout is 26 feet.

The dimensions of the locks are: length between miter-sills, 400 feet; width of chamber, 72 feet.

It will be seen that the Rio del Medio route has been chosen in place of that known as Childs's. The reasons for this are as follows: First, the distance by the former is 2.60 miles less than by the latter; this advantage is about compensated for by a greater summit-height. Second, the valley of the Rio Las Lajas is exceedingly tortuous, giving curves of so small radius that it would be impossible to locate the canal in them, and to cut off the bends would carry the excavation through numerous hills which extend to the river-bank. The third and most potent reason is, that the Las Lajas line intersects no less than five considerable streams, which would have to be taken into the canal and would cause great inconvenience. On the other hand, the Rio del Medio line receives but one stream, and that under so favorable conditions that it can, without trouble and at moderate cost, be sent under the bed of the canal, by means of a culvert which will be found to be estimated for.

HARBOR AT BRITO.

On the right bank of the Rio Grande there is a high rocky hill which juts out into the sea in the form of a promontory for a distance of 1,600 feet. The sides are steep-to. There are, near the outer extremity, 18 feet of water at low tide, close alongside the rocks.

The left bank of the river terminates in a sandy beach, bearing to the south-southwest. An angle is thus formed in the coast which we propose to convert into a harbor by running a breakwater from the end of the point in a southwest direction for a distance of 1,600 feet. The outer end will be in 6 fathoms of water. The rock can be blasted right at hand and dumped into the sea, being allowed to take its own slope. The bottom is a firm sand, but no doubt overlies a bed of rock, judging from the formation of the coast. The deep water extends to within 200 feet of the beach, where some dredging will have to be done.

HARBOR AT GREYTOWN.

A commodious and excellent harbor once existed at Greytown. The strip of sand which formed its outer limits has now extended across what was the entrance, and has converted the harbor into a lagoon. This has been gradually silting up, until there are islands where twenty years ago there was water enough to float a frigate.

The silt which has been destroying the harbor is a volcanic sand, so light as to be held in almost complete suspension by rapidly flowing water; it is the material of which the whole delta of the San Juan has been mainly formed; and, indeed, the entire alluvial district in the vicinity.

A quantity of sand taken from the outer beach at Punta Arenas (as it is still called) was recently submitted, with some from the sea-beach at Monkey Point, thirty-two miles north of Greytown, to Professor Henry, of the Smithsonian Institute. Under his direction the two specimens were examined and compared by the mineralogist of the

institute. As will be seen, they were found to be quite different in composition and structure, showing clearly that the sand from Punta Arenas was not thrown up by the sea, but deposited by the river.

The constituents and peculiarities are as follows, viz:

No. 18.

Sand from Punta Arenas.

Constituents:
- Quartz, a small quantity.
- Tourmaline.
- 10 per cent. magnetic sand.
- Feldspar, small percentage.
- Hornblende, probably.

Color, dark grayish-brown.
Grains fine, but coarser than No. 19.
No fragments of shell in this specimen.

No. 19.

Sand from Monkey Point.

Constituents:
- Quartz, chiefly.
- Tourmaline.
- 3 per cent. magnetic sand.
- Feldspar, small quantity.
- Fragments of marine shells.

Color, light grayish-brown.
Grains very fine.
This sand has evidently been subject to the action of water longer than No. 18.

The question is, can the harbor of Greytown be restored?

The first idea which seems to present itself to every mind as a solution to this problem is, that if the water of the Colorado be turned into the Lower San Juan by a dam placed across the head of the former, this will scour out the harbor and keep open its entrance.

Before we had fully examined the subject, this idea was very generally shared by the officers of the expedition. Its utter impracticability soon demonstrated itself.

For several years the Lower San Juan has been filling up and the Colorado widening and deepening. Just below the forks, the former is now, at the lowest stage of the water, but 324 feet wide and 6 inches deep; the latter is 1,200 feet wide and 10 feet deep. Its banks and bottom are of the silt already described. It is doubtful whether it would be possible to dam the Colorado at all; but if it could be done, the water would be more apt to cut around or under the structure than to make for itself a channel through the Lower San Juan.

A committee of the National Academy of Sciences in 1867 proposed, as a partial remedy for the decay of the river and harbor, the dredging out of the channel of the Lower San Juan and the construction of a wier from Leaf's Island to Concepcion Island. The latter of these is in the main river, near its right bank and above the forks. The former has now become joined to the angle or point of the main land, between the two branches. Concepcion Island is 2,000 feet from the point. The strongest part of the current runs between the two. The island is constantly cutting away at one place and forming at another, being composed entirely of silt banked around drift-logs which have lodged in the shoal water.

The wier, if indeed it could be constructed at all, with such a combination of unfavorable conditions, viz, the depth and strength of the water, and the yielding character of the bottom, would be quite as likely to fail in, as to effect, the object in view, *i. e.*, the turning of the current into the lower San Juan, unless the latter was dredged out to a sufficient width and depth to prevent, by drawing it away, the water from cutting around the dam. This would have to be done for a distance of thirteen miles. I confess myself to have been very much discouraged when these facts and convictions impressed themselves upon my mind.

A thorough examination of the river made subsequently, showed us that all the silt comes from the San Carlos and from other Costa Rican Rivers, having their confluences lower down. This is the reason why the San Juan, below the mouth of the San Carlos, is filled with shoals

and sand-bars. Before this fact had been established, other considerations, already detailed, had forced us to the conclusion that this part of the river could not be used, and that a canal must be built instead.

It is quite clear that, so long as the silt-bearing water is permitted to flow into the harbor, although, by adding to the current, it may assist in scouring at the entrance, it will certainly deposit in the still places, and indeed all over the broader parts of the harbor. Our plan is therefore to cut off the lower San Juan, and send all the water of the San Juan and its lower tributaries through the Colorado mouth, admitting to the harbor only the waters which come through the canal and through the San Juanillo, which will be perfectly clean. The harbor will then have to be dredged out to the proper size and depth. After which there will be nothing to again destroy it. A breakwater or jettee is estimated for to protect the entrance from the surf. The narrow strip of bare sand which divides the bay, if bay it may be called, from the sea, now shifts with every strong breeze that blows, and should be made permanent by covering it with mangrove and tough water-grasses. This might require several years for its accomplishment, but could be done with proper care. The planting should be done at the beginning of the rainy season, and those portions that did not take hold should be supplemented the next year, and so on till the work was complete.

ESTIMATES.

The following are the estimates of the cost of various parts of the work, and are believed to be ample in each case, viz:

Clearing and grubbing	$310,000
13,270,271 cubic yards of excavation in rock, at from $1.25 to $1.50 per cubic yard	18,217,300
28,237,401 cubic yards of excavation in earth, at 35 cents per cubic yard	1,131,025
3,231,500 cubic yards dredging, east side, at 35 cents per cubic yard	19,441,289
941,541 cubic yards of embankment, at 15 cents per cubic yard	1,191,231
Dredging channel in lake to deep water, east side	1,705,379
Dredging channel in lake to deep water, west side	464,100
Dam at Castillo	290,000
Dam at Balas	430,900
Dam at Machuca	318,142
Dam at San Carlos	550,000
Dredging, &c., in river, viz, 3,530,687 cubic yards earth, at 50 cents, and 942,410 cubic yards rock, at $3	4,092,573
20 locks	8,000,000
1 tide-lock at Brito	421,306
Breakwater at Brito	213,330
Breakwater at Greytown	700,000
Dredging at Greytown, cubic yards	1,700,000
Dredging, &c., at Brito	700,000
Diversion of Rio San Carlos	400,381
Diversion of Rio Grande in five places	175,025
Crossing the Rio Zola	87,725
Culverts, west side	70,230
Culverts, east side	380,000
Side-drains, west side	42,240
Side-drains, east side	110,000
Total	.....
Add 25 per cent. for contingencies	.....
Grand total	.....

WATER-SUPPLY.

Lake Nicaragua has a surface area of 2,700 square miles, and drains a territory of not less than 8,000 square miles. It would therefore seem unnecessary to consider the question of water-supply, except to show that it has not been forgotten.

Careful gauges of the San Juan River at numerous points were taken by Lieutenant Miller and party, using a delicate current-meter for the purpose. The least water found, and at about the lowest stage, was 11,390 cubic feet per second, or 984,096,000 cubic feet per day; against this supply we have the following as the maximum demand: Allowing forty lockages a day, or counting the ascending and descending, say eighty per day, without deducting the displacement of the vessels, which in descending we have the right to do, we have—

	Cubic feet.
80 lockages per day	2,240,000
Allowing 1,000 per cent. for leakage, filtration, waste, and evaporation	22,400,000
Total demand	24,640,000
Total supply	984,096,000
Excess of supply over demand	954,456,000

Or, to put it in another form, there is a supply equal to thirty-eight times the maximum possible demand.

CLIMATE, HEALTH, ETC.

The year in Nicaragua, as in the rest of the Isthmus, is divided into two seasons, the wet and the dry; the latter begins about the end of November, and lasts until May or June, when the rains begin, and continue with more or less force during the remaining months of the year.

Unlike the more southerly portions of the Isthmus, the rains here begin earlier and last longer near the Atlantic coast than in the interior. The annual rain-fall differs in different parts of the country, and in the same part differs for different years. No regular system of meteorological observations, continuing from year to year, has ever been established, as far as I have been able to ascertain. The present expedition found at Virgin Bay an aggregate fall of 47.79 inches from July 1, 1872, to March 1, 1873. As this period included the whole of the wet season the result probably does not differ very widely from the average annual rain-fall in that section. In the valley of the San Juan it is probably twice as great. This will, of course, be greatly modified in the event of extensive clearing at any future time.

Nicaragua lies wholly within the trade-wind belt, and during the dry season, when the trades "blow home," the climate is certainly delightful. In the vicinity of Rivas the thermometer seldom stands higher than 82° Fahrenheit in the shade, at mid-day; at night it often falls to 68°. In the valley of the San Juan it is somewhat warmer, but even there one can rarely sleep comfortably at night without a woolen blanket.

There is a very general impression abroad that the whole American Isthmus is exceedingly unhealthy, and this, as I conceive, very incorrect idea is entertained by many intelligent persons who have spent longer or shorter periods upon the Isthmus. It is true that in former years a large percentage of foreigners who remained there for any length of time died or were broken down in health, but nine out of ten of these cases were due to dissipation, or to the neglect of the simplest sanitary precautions, or generally to both. Dissipation will certainly kill much more surely and quickly in the tropics than in a temperate climate, and to just that extent and no more was the climate responsible for these cases. There have been during the last four years three exploring expeditions in Darien and two in Nicaragua. There have been as high as three hundred men employed at once, counting ships' companies, subjected to severe labor and exposure. Not a single officer or man has been lost from climatic disease. Under Providence, I ascribe this entire im-

munity to death and serious disease partly to the following of a few sanitary rules, which anybody may do without inconvenience, but mainly to the strictly temperate lives led by officers and men (some voluntarily and some per force) while operating upon the Isthmus.

The percentage of deaths due to climatic causes alone, I am fully convinced, is smaller than in any other part of the world.

The prevailing diseases are few in number, simple in character, and generally yield most readily to treatment, unless the patient's blood is vitiated by alcohol.

Cleanliness, temperance in eating and drinking, sleeping under shelter and in dry clothing, wearing flannel next the skin at all times, avoiding heavy night-dews, and avoiding bathing immediately after meals or while much heated, are all the precautions necessary to preserve health; and with these any foreigner will be as safe upon the isthmus as anywhere else.

INHABITANTS, PRODUCTS, ETC.

The population of Nicaragua is variously estimated at from 250,000 to 300,000, and consists of whites, Indians, and negroes, and of mixed bloods in all degrees. Many of the Indians are civilized, and among their number are some of the worthiest citizens of the State. There are several tribes, however, in as savage a state as when the country was first discovered. These occupy the northeastern part of the territory.

The state is politically divided into departments. Of these the departments of Rivas, Granada, and Leon, bordering upon the Pacific, contain the bulk of the population and wealth.

The most numerous class of the inhabitants is formed by the Ladinos,* a mixture of white and Indian. Next to these, probably, are the pure Indians. The least numerous of all are the whites.

The laboring classes, both among the civilized Indians and the mixed races, are honest, docile, hardy, and not averse to hard work when occasion requires it, but so few are their natural wants (they have no artificial ones) and so easily supplied that they generally have no need of it. I estimate that, in the event of the construction of a canal, Nicaragua and the neighboring States would supply from 3,000 to 5,000 laborers; but this is very difficult to get at with any degree of accuracy, particularly in view of the probability that many new industries would be developed, each with its demand for operatives. Agriculture and grazing especially would receive an immense impetus.

The average wages of farm-hands and other out-door laborers, at the present time, is $16 per month, and the cost of subsistence at the present rates is $6 per month.

Nicaragua is full of undeveloped sources of wealth, some of these have been experimented with in a limited degree, but nothing to a beginning of its full capacity. Indigo, coffee, and cacao, all of excellent quality, are cultivated and exported to some extent. Sugar is raised, but the machinery used in its manufacture is of the rudest character and the article produced of very poor quality, though the cane is rich enough to rival the best in the world. Corn, beans, rice, yams, cassava root, quiquisque, a superior kind of yam, tobacco, plantains, bananas, oranges, limes, pine-apples, mangoes, watermelons, cantelopes, tomatoes, cocoanuts, nisperas, peppers, and numerous other fruits and vegetables grow in all parts of the country, and almost spontaneously. Near Greytown the delicions bread-fruit is raised, though hitherto no one has succeeded in producing it in the interior.

* This word is used with a different signification in some parts of Spanish America.

Of the domestic food-animals are beeves, hogs, goats, sheep, turkeys, ducks, common fowls, &c.

The forests are filled with game, among which are deer, wild hogs, tapirs, armadilloes, rabbits, turkeys, pheasants, ducks, mountain hens, pigeons, and many others. The manitee is found in the rivers and lagoons, and is highly esteemed as an article of food. The rivers and adjacent seas abound in fish of many varieties. Turtle are taken on the coasts. The country can abundantly supply all the subsistence which would be required in the event of a canal being constructed. Many articles yield two crops a year, others yield perpetually. Even the rude cultivation now given to the ground produces abundant returns. With the introduction of improved machinery and implements, and proper system, the yield might be augmented indefinitely; and it seems altogether probable that, with the increased facilities of transportation that must follow a large influx of people, added to the improvements above spoken of, prices will remain where they now are, even with the largely increased demand.

Abundance of valuable timber for construction, cabinet-work, dye-woods, &c., are found in all parts of the country, among others are mahogany, rose-wood, lignum-vitæ, cedar, moran-nispera, roble, ceiba, madera-negra, ron-ron, laurel, melon-tree, madroño, fustick, Brazil-wood, granadillo, cortes or iron-wood, guapinel, pochote, guanacoste, espanel, and others. The espanel is said to be impervious to the teredo navalis. The India rubber tree is found in many parts of the country, and furnishes a rapidly growing article of export.

Cochineal has been cultivated to some extent.

Medicinal plants and trees abound, though very little use is made of them so far.

There are many plants whose fibres are valuable; among these are cotton, pita, piñela, tule, palm, and cocoa-nuts. Hats, cordage, hammocks, and some other articles are made with rude appliances.

Rock, limes, and clays needed for construction are to be had in great abundance. It is proposed to use concrete in place of dimension stone in the construction of locks, dams, &c. Material for this can be had immediately at hand in every case.

Gold and silver are found in paying quantities. The richest mines now being operated are in the department of Chontales on the east side of the lake. This region has been so little explored as to make it altogether improbable that a tithe of its mineral wealth has been discovered.

An inter-oceanic ship-canal across the American isthmus has been so long a subject of discussion among statesmen, merchants, and navigators, its desirability so often proved by able pens, the enormous saving of distance, cost, and risk which it would give to the commerce of the world so carefully tabulated, that there seems to be nothing left to prove except its feasibility; this I believe we shall be able to do from the information now in our possession, and that the line which has just been examined through Nicaragua presents by far a better combination of favorable conditions than any other route which has as yet been examined.

I have the honor to be, sir, very respectfully, your obedient sevvant,

EDWARD P. LULL,
Commander United States Navy,
Commanding Nicaragua Surveying Expedition.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

No. 14.

POLARIS EXPEDITION.

[Telegram No. 1.]

SAINT JOHN'S, NEWFOUNDLAND, *May* 9, 1873.

TO SECRETARY OF STATE, *Washington, D. C.:*

Sealing steamer Walrus just arrived; reports steamer Tigress picked up on the ice off Grady Harbor, Labrador, on 30th April, fifteen crew of United States Polaris and five Esquimaux. Captain Hall died last summer. Tigress hourly expected. Will give further particulars.

T. N. MOLLOY,
United States Consul.

[Telegram No. 2.]

SAINT JOHN'S, NEWFOUNDLAND, *May* 9, 1873.

TO SECRETARY OF STATE, *Washington, D. C:*

Just returned from Bay Roberts, Captain Tyson having reached north latitude 82.16; reached winter quarters in September, 1871, in latitude 81° 38″, longitude 61° 44″. Captain Hall died of apoplexy 8th October, 1871; was buried about half mile southeast of ship's winter quarters. Crossed Kane's polar sea, said to be a strait about fourteen miles wide with appearances of open water north. Left winter quarters August 12, 1872; got on beam ends 15th same month; thence drove south to 77, 35 in ship, when, owing to heavy pressure of ice, vessel was thrown up, and while landing stores, &c., vessel broke away from her mooring, and part of crew now here were drifted away south. Vessel last seen under steam and canvas making for harbor on east side of Northumberland Island. Polaris is without boats; lost two in a northern expedition; two landed on ice with Captain Tyson; one burnt to make water for crew; the other now in Bay Roberts. Crew lost vessel on 15th October, 1872; were picked up last April by Tigress in latitude 53.30, having been 197 days on ice. No lives were lost when last on board ship. She made no more water than during past winter and fall, but had received heavy injury to stem, causing her to leak badly. Names of crew here are Captain Tyson, Frederick Meyer, John Heron, W. C. Kruger, Frederick Jamka, William Nindeman, Frederick Authing, Gustavus Linguist, Peter Johnson, William Jackson, the Esquimaux Joe, Hannah, and child, Hans Christian, of Kane's expedition, wife, and four children, (youngest only eight months old.) Polaris is in charge of Captain Buddington. Crew have lived on a few ounces daily, and latterly on raw seals, eating skins, entrails, and all for the past two months, and are all in fairly good health. Captain Tyson does not expect Polaris will get clear before July, if in condition to come home. There were fourteen left on board, with plenty of provisions, and, if vessel be not fit to come home, they can easily construct boats for their safety. All provided for in Bay Roberts; will come here Monday.

T. N. MOLLOY,
United States Consul.

[Telegram No. 3.]

SAINT JOHN'S, NEWFOUNDLAND, *May* 12, 1873.

TO ACTING SECRETARY OF STATE, *Washington, D. C.:*

No direct steamer for the United States. Tigress owners offer to convey Polaris crew to New York free of charge, if Government will charter her to go in search of missing portion of expedition; consider her most suitable steamer in every respect; could leave on Wednesday. Do crew come under head of destitute seamen? Which Department do I draw on for expenses? Are Esquimaux to be forwarded? Steamer Nestorian may call on Thursday on way to Halifax, if coast clear of ice. Passage to Halifax $20 each.

T. N. MOLLOY,
United States Consul.

[Telegram No. 4.]

SAINT JOHN'S, NEWFOUNDLAND, *May* 12, 1873.

TO SECRETARY OF NAVY, *Washington, D. C.:*

Tigress just arrived; all landed; shall send further particulars to-night.

T. N. MOLLOY,
United States Consul.

[Telegram No. 5.]

SAINT JOHN'S, NEWFOUNDLAND, *May* 12, 1873.

TO SECRETARY OF STATE, *Washington:*

All Polaris crew just landed; all cared for; wait answer for further proceedings.

T. N. MOLLOY,
United States Consul.

[Telegram No. 6.]

SAINT JOHN'S, NEWFOUNDLAND, *May* 13, 1873.

TO SECRETARY OF NAVY, *Washington:*

Crew of Polaris want $20 each besides clothing and boarding. Captain Tyson and Fred. Meyer, of signal-office, want funds also. Say amount I can advance on each account. Esquimaux and crew on sick-list to-day. Harbor blocked with ice.

T. N. MOLLOY,
United States Consul.

[Telegram.]

NAVY DEPARTMENT,
Washington, May 13, 1873.

UNITED STATES CONSUL,
Saint John's, Newfoundland:

Take care of Polaris crew. Draw on Department or on Jay Cooke, McCulloch & Co., London, as most advantageous, notifying Department by telegram. Will telegraph how they can come home when determined.

GEO. M. ROBESON,
Secretary of the Navy.

UNITED STATES CONSULATE,
St. John's, Newfoundland, May 13, 1873.

SIR: I have the honor to inclose herewith a copy of a communication received from the owners of the steamship Tigress in reference to an offer to the Government to convey to New York the crew of the steamship Polaris, and also a tender of the said ship, with terms, in the event of the Government intending to search for the missing members of the expedition.

I also have the honor to inclose copies of telegrams sent, connected with this circumstance of the disaster to the expedition, for the information of the Department, and I have made the necessary arrangements for the proper treatment of the crew, having advanced them what I considered requisite for their comfort under the trying circumstances in which they have been situated. Since their landing yesterday, there has been a material reaction as regards their health, and I find, from both medical and my own observation, that most of them begin to feel the injurious result of their long sufferings and hardships which they have endured, several of them giving way, and fear will not be well enough to proceed home for at least a fortnight. At present there is no conveyance offering to take them direct to the United States, and although the mail-steamer Nestorian is due to-night or in the morning, by which this is intended, via Halifax, yet, from the coast being blockaded with ice, and the wind prevailing from the east, pressing the ice on the shore, there is very little probability of the Nestorian getting in here, and will likely have to pass by to Halifax without coming in.

In the event of the Government requiring a steamer, there are several here well adapted for a northern voyage, and which could be purchased or hired for a month or years.

I sent a telegram yesterday stating that the crew wanted money, (account of wages,) also Captain Tyson and Fred. Meyer, of the signal station. Already advanced $300, and given it to Captain Tyson to be divided among them, and have taken his receipt for the same, the particulars of which shall be sent forward in due course. Captain Tyson and Meyer have intimated that they will require about $1,200 between them.

The next Allan line steamer from Liverpool is due here about the 26th instant, and will go direct to Baltimore, by which the crew can go, unless you order otherwise in the mean time.

I have the honor to be, most respectfully, your obedient servant,

THOS. N. MOLLOY,
United States Consul.

HON. SECRETARY OF THE NAVY,
Washington, D. C.

UNITED STATES STEAMER FROLIC, (4th rate,)
Navy-Yard, Washington, June 5, 1873.

SIR: I have the honor to report that, in obedience to your order of the 15th May, this ship, under my command, left New York on the evening of May 16, passed through Hell Gate, and arrived at Saint John's, Newfoundland, at 6 o'clock on the morning of the 22d.

The weather was generally good during the passage, but on the night of the 19th, while passing Sable Island, it became so thick that I was obliged to direct speed to be reduced on account of the fog, as well as

on account of passing a dangerous place. This prevented the ship from arriving at her destination on the 21st.

Cape Saint Mary and Cape Pine were sighted just after noon of the 21st, and Cape Race was rounded at 6 p. m. of that day.

Before reaching Cape Race, five large icebergs were passed, and during the following night one hundred and twenty were passed, including three floes of ice, the smallest of which I estimated to be about half a mile in diameter and the largest three or four miles. To avoid this ice the ship was kept well in-shore, which is steep-to. The ship was kept at low speed until day-light, as no one on board had been to Saint John's before, and no one was acquainted with the coast. I was unable to procure a Newfoundland pilot at New York.

The ship does not carry enough coal to burn more per diem than was used on the passage, and the complement of the ship is so small that there are not men enough to keep more fires going. On the passage east, twelve of the fourteen furnaces were kept going, and when in her best trim no more than ten knots were made.

Upon the arrival of this ship at Saint John's, I sent a letter to the United States consul at that port, asking for those persons rescued from the Polaris. The consul called upon me at once and stated verbally that the rescued people would be delivered before the ship sailed.

* * * * * * *

The day of our arrival was a religious holy-day, on which no labor could be had. The 24th being a national holiday, little could be done, and on Sunday no coal could be procured.

The intervention of these days delayed the ship. She had not received her coal until the evening of Tuesday, and sailed at 4 a. m. of Wednesday.

I did not leave Saint John's the latter part of the day on account of thick weather and ice, the latter this ship not being able to combat.

On the afternoon of the 27th I received nineteen persons of the crew of the Polaris, the list of whom is substantially the same as that furnished by the Department.

After passing Cape Race, at noon of the 28th, we were in a dense fog for fifty-three hours, except for a short time on the night of the 29th. The speed was consequently lowered on that account, as well as from the fact of having a strong head wind and heavy sea.

Distance was lost by cleaning the tubes, which the Cardiff coal frequently obstructed. No anthracite coal could be had at Saint John's, and there were but two lots of Cardiff coal, one of which was purchased. Native coal, I do not think, would have lasted the passage.

Sails were used to the best advantage. The Esquimaux are in two families, two male adults and the rest women and children. These are kept aft, and are occupying officers' apartments.

* * * * * * *

While at Saint John's I inspected, by request, the British steamship Tigress, and found, as far as I could judge, the representations of Messrs. Harvey & Co. to be correct as to her strength and construction. A copy of the letter from these gentlemen I forward.

Should it be the intention of the Department to dispatch a vessel to the polar regions, the Tigress is, in my opinion, the best one suited for that purpose.

To conclude, I regard the Frolic as one of the best and easiest seaboats I have ever been on board of, and I believe her to be as strong as ships built of iron usually are.

For a passage of a week or more the bunkers do not carry enough

coal for a consumption of more than about nineteen tons per diem, which, under favorable circumstances, will send the ship about two hundred miles.

The fact of not bringing back the boat of the Polaris is explained in my correspondence with the United States consul at Saint John's. This ship arrived at this port at 1.15 p. m. of this day.

I forward copies of correspondence.

I have the honor to be, very respectfully, your obedient servant,

C. M. SCHOONMAKER,
Commander United States Navy.

Hon. GEO. M. ROBESON,
Secretary of the Navy.

SAINT JOHN'S, *May* 10, 1873.

DEAR SIR: You are already aware that the steamer Tigress has returned to Bay Roberts, having rescued nineteen of the crew of the Polaris.

If it is the purpose of your Government to send in search of the other members of the expedition, we beg, on behalf of the owners of the Tigress, to say that she will be at their service, and is probably as suitable a vessel as any that could be built for that purpose.

We will undertake to convey the persons already on board her to New York, and then deliver the steamer up to your Government, who may appoint their own officers, engineers, and crew, send her to the Arctic regions, and then deliver her up to us in New York, when it suits their convenience, in as good order as when they received her.

If they deliver her up to us in New York during the present year, (1873,) to pay the Tigress for services already rendered, and probable loss of a trip of seals by leaving the ice to bring home these people, and for her use until delivered up to us in New York, $30,000, American currency; if she should be caught and have to winter in the Arctic regions and not be delivered up to us until 1874, $60,000; if she should be lost during the voyage, the Government to pay $60,000 for her, and hire up to the date of their acquainting us with her loss.

She is well found in everything necessary for encountering an Arctic voyage, having last year been for the whale season in Cumberland Inlet or Baffin's Bay.

The vessel, as you know, is eighteen months old, fully sparred, and plenty of sail, compound engines, burning six to seven tons of soft coal in twenty-four hours for a speed of eight knots; would require docking and provisions only to proceed on the voyage.

We are, dear sir, yours truly,

HARVEY & CO.

T. N. MOLLOY, Esq.,
American Consul.

P.S.—You might acquaint your Government of the probable value of some of the second [sealing] trips brought in this year.

The above copy of Mr. Harvey's letter was furnished me by T. N. Molloy, esq., United States consul at Saint John's, Newfoundland, May 27, 1873.

C. M. SCHOONMAKER,
Commander.

UNITED STATES STEAMER FROLIC,
Saint John's, Newfoundland, May 22, 1873.

SIR: I have been dispatched in command of this ship to this place to receive the party from the Polaris, including the Esquimaux, on board for transportation to the United States. I request you to deliver them to me for that purpose as soon as practicable, wishing to return at once where coal can be obtained.

You will please inform me if any stores or conveniences will be required for the health and comfort of these persons besides what is usually carried on board men-of-war, in order that I may procure the before leaving.

Very respectfully, your obedient servant,

C. M. SCHOONMAKER,
Commander United States Navy.

T. N. MOLLOY, Esq.,
United States Consul, Saint John's, Newfoundland.

UNITED STATES CONSULATE,
Saint John's, Newfoundland, May 22, 1873.

SIR: I have the honor to acknowledge the receipt of your communication of 22d instant; and, in reference to the boat belonging to the Polaris, she is now at Bay Roberts, and I have directed her to be delivered up to me by first conveyance from that place; but if not here in time to be sent by the Frolic under your command, shall keep her here until future orders from the Navy Department.

The canoe belonging to Joe Eberbing (the Esquimaux) will be sent on board, with three rifles and two bags of furs.

I have the honor to be, most respectfully, your obedient servant,

THOS. N. MOLLOY,
United States Consul.

C. M. SCHOONMAKER,
Commander, Commanding United States Steamer Frolic.

UNITED STATES STEAMER FROLIC,
Saint John's, Newfoundland, May 22, 1873.

SIR: I wish to inform you that I will receive on board and carry to the United States the boat and canoe which were brought to this port by a part of the crew of the Polaris.

Very respectfully, your obedient servant,

C. M. SCHOONMAKER,
Commander, Commanding.

T. N. MOLLOY, Esq.,
United States Consul, Saint John's, Newfoundland.

UNITED STATES CONSULATE,
Saint John's, Newfoundland, May 27, 1873.

SIR: Agreeably to your communication of the 22d instant I have the honor to deliver up to you the party rescued by the sealing-steamer Tigress, Captain Bartlet, belonging to the United States steamer Polaris

of the Arctic expedition, and also inclose herewith the names of the party as registered in this consulate.

I have the honor to be, most respectfully, your obedient servant,

THOS. N. MOLLOY,
United States Consul.

C. M. SCHOONMAKER,
Commander, Commanding United States Steamer Frolic.

List of persons rescued belonging to the Polaris, of the Arctic expedition.

George E. Tyson.
Frederick Meyer.
William Jackson.
J. W. C. Kruger.
Peter Johnson.
Frederick Jamka.
William Nindemann.
John Heron.
G. W. Lindguist.
Frederick Authing.
Hans Hendrick, wife and four children. } Esquimaux.
Joe Eberbing, wife and daughter. }

Saint John's, Newfoundland, May 27, 1873.

THOS. N. MALLOY,
United States Consul.

UNITED STATES STEAMER FROLIC, (4th rate,)
Navy-Yard, Washington, June 5, 1873.

SIR: I respectfully forward the list of passengers of this ship for the passage from Saint John's, Newfoundland, to this station. (Form No. 10.)

I have the honor to be, very respectfully, your obedient servant,

C. M. SCHOONMAKER,
Commander United States Navy.

Hon. GEO. M. ROBESON,
Secretary of the Navy.

Forwarded by—

L. M. GOLDSBOROUGH,
Rear-Admiral, Commanding.

List of officers or others arrived as passengers in the United States steamer Frolic. Dated at Washington, D. C., the 5th day of June, 1873.

Names.	Rank.	Remarks.
George E. Tyson....	Assistant navigator.	The names in this list are the same as furnished by the United States consul at Saint John's, N. F. This list is substantially the same as the one furnished by the Department.
Frederick Meyer....	Meteorologist.	
William Jackson....	Cook.	
J. W. C. Kruger.....	Seaman.	
Peter Johnson.....	Seaman.	
Frederick Jamka...	Seaman.	The list comprises that part of the crew of the Polaris who were rescued from the ice by the British steamer Tigress. These persons were received on board for passage to the United States at Saint John's, N. F., on May 27, 1873.
William Nindemann.	Seaman.	
John Heron.....	Steward.	
L. W. Lindguist.....	Seaman.	
Frederick Authing..	Seaman.	
Hans Hendrick, wife and four children..	Esquimaux.	
Joe Eberbing, wife and daughter.....		

C. M. SCHOONMAKER,
Commander, Commanding.

PROCEEDINGS OF THE JUNIATA IN THE SEARCH FOR THE POLARIS.

NAVY DEPARTMENT, *June* 19, 1873.

SIR: The Juniata is to proceed to Greenland to obtain tidings of the Polaris, to communicate with her, and to aid in her rescue. The steamer Tigress will shortly follow. Whenever the Juniata is ready for sea you will go direct to Saint John's, Newfoundland, fill up with coal, stowing as much on deck as can be conveniently carried, and, without further loss of time, make the best of your way to the port of Godhavn, on the island of Disco, on the west coast of Greenland, having due regard to the safety of your ship while navigating through a region in which more or less ice is usually to be met with at this season of the year. On arriving at Godhavn, communicate with the Danish authorities at that place, to whom you are furnished with letters of introduction, and ascertain if any intelligence has been received of, or from, the Polaris since October, 1872, when she was last seen, under Northumberland Island, in about the latitude 77° 13′ north, longitude 72° west.

Acting upon whatever information you may receive, or, in the absence of any, you will endeavor, with the aid of the Danish authorities, to open communication with the Polaris, by means of the Esquimaux, without delay. Any other measures for procuring intelligence of the Polaris, or for her relief and rescue, that may commend themselves to your best judgment, you are authorized to take, *except endangering your own ship and men within the ice.* Should, however, the navigation of Baffin's Bay be sufficiently open, as it at times is, to pursue it to the northward in an ordinary ship, you will carry the Juniata up the coast to Upernavik, and farther, if practicable, with safety, keeping a lookout for the Polaris, and for her people on the way. Should you be so fortunate as to rescue them, you will return to Godhavn, discharge all your obligations at that place, leave the requisite information for the Tigress, and return with all dispatch to New York; otherwise you will not leave Godhavn, to return homeward, until the last moment of the navigable season in the fall.

Upon falling in with the Tigress you will aid her in her search to the northward, as far as you can proceed together, unless you have already rescued the party; and when you part company if she has to go on to the north, make the best arrangements you can for awaiting her return, either at Upernavik or at Godhavn, beyond any risk to the Juniata from the ice. The Tigress is to push on for Northumberland Island if the Polaris, or her people, are not met with lower down; and, in that case, is not to fail to reach the island, even if she may have to winter in its vicinity. If the Polaris is reached she is not to be abandoned, if it is possible to bring her out; but, if she cannot be saved, her officers and men, and everything of value, are to be removed to the Juniata, or to the Tigress, as may be most convenient. If rescued she is to come homeward under the convoy of both the Juniata and Tigress, until clear of all danger from the ice, when you will hasten your own arrival at your destination, leaving the Tigress to convoy the Polaris into port.

The coal and stores which were landed at Godhavn by the Congress, for the Polaris, are to be used to the best advantage. Coal may, perhaps, be obtained at or about that port, if needed. Communicate with the Department whenever an opportunity offers.

At Saint John's you will fill up the Juniata with soft coal, such as is

requisite for the use of the Tigress. This coal you will supply the Tigress with at Disco, or leave it there for her. In the execution of the duty to which you are assigned by these orders, much must be left to your judgment; and the Department here reminds you that in no event must you put your vessel, or the lives on board of her, in any jeopardy from the ice, for which the Juniata has not been built, or repaired, or specially fitted. Inclosed herewith is a letter from the Danish minister to the Danish authorities in Greenland, asking them to render you all assistance and co-operation with the expedition under your command.

Respectfully,

GEO. M. ROBESON,
Secretary of Navy.

Commander D. L. BRAINE, U. S. N.,
Commanding United States Steamer Juniata,
United States Navy-Yard, New York.

NAVY DEPARTMENT,
Washington, July 10, 1873.

SIR: Should the Tigress join company with the Juniata, her commander is directed, as usual, to show his instructions to his senior officer, and the Department desires you to assist in carrying out these instructions in every way, and particularly to facilitate his progress to the northward by every means in your power, keeping in mind the fact that the Tigress is fitted and ordered to make her way, if necessary, to the point where the Polaris was last seen, by every means possible and in the face of every danger, while you are ordered only to advance as far in that direction as you may be able to go without subjecting your ship to more than ordinary risk and danger, and the fact that the Tigress is fitted to encounter the ice, while you are not. Should you be in company when you meet the ice, or enter the latitudes where it may be dangerous, you will not detain her with you if her commander thinks it proper to push on, but will allow her to proceed at his own discretion, having informed him where he may expect to find or communicate with you on his return to Godhavn.

Your orders in respect to the Juniata are full and complete, and the Department further depends upon you to advance and further in every way the special object for which the Tigress is fitted out, and to facilitate her advance northward as the special expedition upon which the Department relies for the relief and rescue of the Polaris, her officers and crew, should they prove to be beyond the reach of assistance by the ordinary naval means which may be afforded by the Juniata under her orders. As the officers and crew of the Tigress have been selected with special reference to the circumstances of the case, you will not interfere in any way with her *personnel*, except at the request of her commander or under the pressure of imperative professional necessity; and should she be fortunate enough to rescue the Polaris and afterwards join you, you will permit her to convoy her home.

Reminding you that the season of operations is necessarily short, and that every necessary measure at your command must be taken in the most prompt and effective manner,

I remain, your obedient servant,

GEO. M. ROBESON,
Secretary of the Navy.

Commander DANIEL L. BRAINE,
Commanding U. S. Steamer Juniata, (By U. S. Steamer Tigress.)

No. 25.] UNITED STATES STEAMER JUNIATA, (3d rate,)
Off Battery, New York, June 24, 1873.

SIR: I have the honor to report to the Navy Department that, in obedience to its orders of the 19th and 23d instant, I have sailed with this vessel under my command this day from this port in search of the Polaris.

I am, sir, very respectfully, your obedient servant,

D. L. BRAINE,
Commander U. S. N., Commanding Juniata.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

No. 30.] UNITED STATES STEAMER JUNIATA, (3d rate,)
Saint John's, Newfoundland, July 9, 1873.

SIR: I have the honor to report the arrival of the United States steamer Juniata, under my command, at this port, June the 30th, and this being the first opportunity of communicating by mail, I avail myself of it. Your telegraphic dispatch of the 29th of June was duly received.

Since my arrival here, I found that several sheets of the thin sheet-iron placed on the bows of this ship at New York had washed off. After consultation with the ice-pilot, I have had the bow properly sheathed and prepared for meeting the ice through which I may have to run the ship between here and Upernavik.

* * * * * * *

I beg leave to report that our national holiday was duly observed as such by decorating the ship with flags and a holiday for the crew.

Having made all the preparations for sea, I shall sail this day for Greenland, in search of the Polaris upon my way, and in obedience to your written and telegraphic orders.

The health of the officers and crew, I have the pleasure to say, is excellent.

I am, sir, very respectfully, your obedient servant,

D. L. BRAINE,
Commander U. S. N., Commanding U. S. Steamer Juniata.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

No. 31.] UNITED STATES STEAMER JUNIATA, (3d rate,)
Holsteinborg, Greenland, July 19, 1873.

SIR: I have the honor to report, since my letter of the 9th instant, written from Saint John's, New Foundland, that on July 14 I arrived off Fiskenaes, but, being unable to get a pilot, I proceeded to Sukkertoppen, which port I entered on the 17th instant, and found that no dogs were to be procured. July 18, sailed, and arrived at Holsteinborg the same day.

I have this day, through the courtesy of Governor Frederick Larssen, procured eighteen dogs, also one hundred and fifty seal-skins to make clothing for the men and officers of the Tigress, and I shall sail, weather permitting, to-day for Disco, where I will land the soft coal for the

Tigress, and then proceed to Upernavik in the execution of your orders.

As yet, and I have news from Disco up to the 10th instant, no tidings have been received from the Polaris.

The ice is reported very heavy in Omenak Fiord and at and above Upernavik.

The health of all the officers and crew of this vessel is excellent.

I have the honor to be, very respectfully, your obedient servant,

D. L. BRAINE,

Commander U. S. N., Commanding U. S. Steamer Juniata.

Hon. GEORGE M. ROBESON,

Secretary of the Navy, Washington, D. C.

P. S.—This letter is sent per Danish brig Constance, via Copenhagen, Denmark.

No. 3] GODHAVN, DISCO ISLAND, GREENLAND,

July 29, 1873.

SIR: I have the honor to report, since my last communication of the 19th instant, I have proceeded, with the United States steamer Juniata under my command, to this port, where I have just landed about seventy tons of Cardiff coal for the use of the Tigress, the same carefully bagged and placed in the store-house. I also landed a quantity of lumber, which, I have no doubt, will be of great use to her. I have also landed the eighteen dogs purchased at Holsteinborg, besides twelve additional ones procured here, and I leave here directions to have them all delivered to the Tigress. I would here note that I find all the stores left here by the Con ress : nd Polaris apparently to be in good order. I have also taken from the store-house $55\frac{550}{2240}$ tons of anthracite coal for the use of this ship.

My previous communication was dated July 19, Holsteinborg, and was sent per Danish brig Constance, via Copenhagen. The seal-skins which we procured at that port, from which we sailed July 21, 1873, are now being prepared here, to be made into clothing for the officers and men of the Tigress. I found it impossible here to procure any furs for the same purpose, but at Upernavik I am in hopes to obtain all that I desire.

It is my intent this day to sail for Upernavik, where I will endeavor to obtain information of the Polaris by sending out Esquimaux, with liberal offers of money or other articles as inducements for them to go, if possible, to obtain information of her whereabouts, so I may impart the same to the commander of the Tigress immediately upon her arrival. Should I not have the desired information, and the navigation is open to the northward, I will then accompany the Tigress as far to the northward as it is prudent for this ship to go; and I would here state that I am informed that, although this last winter in these regions has not been so mild as the two preceding ones, it has by no means been severe, and it is very likely the ice of Baffin's Bay has been adrift the whole winter through.

When we separate it is my intention, as far as present information warrants, to return to Upernavik, and remain there as long as open navigation will permit, say until August 30, upon which date I will proceed to Godhavn, Disco Island, and remain at that port until September 20 or 30, and then proceed to Holsteinborg, where I propose to wait until

the latter part of October, at which point, by the following proposed means, I have hopes to bring you intelligence of what the Tigress may have accomplished, and the whereabouts of the Polaris or her officers and crew. I will arrange with Commander Greer, if the Tigress be frozen in to the northward of Upernavik, that he will send Esquimaux with information to Upernavik; from that point Esquimaux will bring it to Godhavn, Disco Island, and from there to me at Holsteinborg, from which port I will sail for Saint John's, Newfoundland, proceeding under sail, as my coal will probably be exhausted by that date.

I have the honor to report that we have been received with much courtesy and kindness at this place, and every facility afforded us by Mr. Müldrüp, the assistant governor, in the absence of the governor, Mr. S. T. Krarüp Smith. The health of the officers and crew of this ship is excellent. The original of this was sent per Danish bark Thorwaldsen, via Copenhagen.

I am, sir, very respectfully, your obedient servant,

D. L. BRAINE,

Commander U. S. N., Commanding U. S. Steamer Juniata.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

No. 34.] UNITED STATES STEAMER JUNIATA, (3d rate,)
Off Upernavik, Greenland, August 10, 1873.

SIR: I have the honor to report, since my last communication from Godhavn, island of Disco, Greenland, under date of July 29, 1873, I have proceeded to this place with the United States steamer Juniata under my command, arriving July 31.

I will now proceed to give you in detail up to this date all that I have done at this place in carrying out your orders of June 19, 1873.

The seal-skins procured at Holsteinborg, and prepared at Disco, were landed the day of my arrival, and, with others procured here, will be made up into clothing for the officers and crew of the United States steamer Tigress, and be finished, I hope, before her arrival, so no delay may occur in their proceeding to the northward. I have ordered the clothing under advice from the authorities here, as otherwise the Tigress would be delayed two weeks or more in procuring it.

After consultation with Governor Rudolph, of this place, (who has rendered me every facility in forwarding the expedition in search of the Polaris,) I found it impossible to arrange with the Esquimaux to proceed to the northward in search of the desired information of the officers and crew of that vessel.

Governor Rudolph informed me that the navigation to the northward was and had been unusually open this year, and free of floe-ice; that, indeed, as he expressed it, "there had been no winter." He assured me if I dispatched a steam-launch he could furnish her with a thoroughly competent Esquimaux pilot, who is a dog-driver and hunter also. I then decided to send the large steam-launch of this vessel, (and I may here state that, anticipating a search to the northward, in obedience to your orders, would have to be successfully accomplished under steam, I had the steam-launch prepared by sheathing her with wood, placing iron on her bows, and an iron guard or frame around her propeller,) to skirt the fast ice of the coast, to obtain all the information she could, and return by August 15, 1873, or before the Tigress would proba-

bly reach Upernavik. She was supplied with a most thorough outfit to make the reconnaissance. August 2, 1873, Lieut. George W. De Long, navigator of this vessel, was assigned to command her, and she was named the Little Juniata; lieutenant, Charles W. Chipp; ensign, Sidney H. May; pilot, Henry W. Dodge; boatswain's mate, Richard Street; machinist, Frank Hamilton; William King, seaman extra; and Martin T. Maher, ordinary seaman, and an Esquimaux pilot, named Jacob, formed the officers and crew, who, previous to starting, were each furnished with complete suits of fur clothing. The steam-launch was provisioned for sixty days full and one hundred and twenty days half ration; had coal for seventeen days' full steaming, and she sailed on August 2 for Tessuisak, from which point she sailed August 3 to the northward. At this date, August 10, she has not yet returned, but the weather has been excellent, and I feel confident she will soon be here.

At this place I met Inspector S. T. Krarüp Smith, of Disco, who furnished me with the following information: Early in June, 1873, two English steam whale-ships, named the Eric, Captain Walker, and the Arctic, Captain Adams, on board of the latter, Commander A. H. Markham, of the royal navy, stopped at Disco, and Inspector Smith told them the news of the rescued party, and, with great forethought, requested them to look along the ice for the Polaris, or her officers and crew, in their passage to the northward, which the captains of these vessels kindly promised to do. Hence, if they skirt the ice to the westward, in Baffin's Bay, which they have probably done by this time, and the Little Juniata looks along the coast, the Tigress can proceed in the most direct and expeditious route to Northumberland Island; and I am sanguine that, with these three modes, the ship or her officers and crew will be rescued from their perilous position, although as yet nothing has been heard from them at this point.

I have further to state that another vessel, the Ravenscraigh, has proceeded to the northward on a whaling voyage, and has also been requested to keep a lookout for the Polaris.

Upon inquiry I am informed that it will be impossible to get the Esquimaux of this place to proceed in a kayak to Godhavn, Disco, after September 1; hence it will be impossible for me to get information from this place after that date, unless I am successful in inducing the governor of this place to send one of his sailing-vessels to that point. I have it in my mind, and may probably order our large steam-launch, upon her return to this point, to await for news until a certain day in September, and bring it to me at Disco, if so obtained. Should the Tigress successfully return, she can, of course, convey the launch to Godhavn.

After leaving this point it is my intent to obtain, if possible, coal from the mines on the island of Disco, opposite to Rittensbek. I shall also, if the inspector, Governor S. T. Krarüp Smith, consents, send a 50-ton sailing-craft to the westward of Godhavn, to search along the pack-ice for the Polaris, which vessel he thinks may be inclosed in it and drifting to the southward.

* * * * * * *

Should I not get the desired coal on Disco Island upon my return to the United States, I may probably have to stop at Iviktout, with the double object, first, to obtain information of the Polaris, should she have got out of the pack-ice in the neighborhood of Holsteinborg or Sukkertoppen, as Inspector Smith informs me she would probably go to Iviktout; secondly, to obtain coal for this vessel, and in order to know what facilities there are for procuring the same, and to obtain information of

the Polaris. Upon the advice of Inspector Smith, I shall in a few days dispatch an Esquimaux in a kayak to Sukkertoppen, Holsteinborg, and Iviktout, to return to Godhavn, Disco, with information on these two points, viz, as to whether the Polaris has been heard from at those two places, and whether coal can be procured at Iviktout.

I am happy to state that we have thus far successfully navigated, with very imperfect charts, through dense fogs amongst innumerable icebergs and unknown islands and rocks, and had several very narrow escapes, arising from the dense fog, although we have thus far been favored with continuous daylight. The ship is in good order, but short of coal.

I cannot definitely state when I will sail for Saint John's, Newfoundland, as so much depends on the success or non-success of the Tigress or the Little Juniata, or the sudden appearance of the Polaris herself; but you may rest assured that your orders will be carried out, as far as it is in my power, with great earnestness. The health of the officers and crew is excellent.

I send this communication via Iviktout, Greenland, and the original via Copenhagen, Denmark, per Danish bark Thorwaldsen.

I am, sir, very respectfully, your obedient servant,

D. L. BRAINE,
Commander U. S. N., Commanding U. S. Steamer Juniata and Senior Officer Present.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

P. S.—I deem it my duty to mention that Lieut. Commander Edgar C. Merriman volunteered to go with the steam-launch and search for the United States steamer Polaris to the northward of this place, but Lieutenant De Long having previously volunteered, I had promised him, if I sent her, he should be the officer assigned for that duty.

D. L. BRAINE,
Commander U. S. N.

No. 35.] UNITED STATES STEAMER JUNIATA, (3d rate.)
Off Upernavik, Greenland, August 12, 1873.

SIR: I have the honor to inform you that the United States steamer Tigress, Commander James A. Greer, U. S. N., commanding, arrived here August 10. She was filled up with coal from the Juniata, and provided with everything she required.

David M. Howell, machinist, and Thomas Hovington, seaman, condemned by medical survey, (sick,) were received from her; also, S. Harding, (seaman,) complained of by Commander Greer as a skulk and worthless; and in their places I have transferred from this vessel to the Tigress the three following named, who are excellent men: Thomas Craven, machinist; Peter Newman, seaman; and Peter Brown, landsman, accompanied by their necessary transfer papers.

At 5.15 p. m. the 11th of August the Tigress steamed away north for Tessiusak in the performance of your instructions. We all gave her our heartiest good wishes and cheers. I will wait at this place until the 20th instant in hopes to hear from the Tigress.

I inclose herewith, for the information of the Department, a copy of the orders issued by myself, as senior officer present, to Commander Greer previous to the sailing of the Tigress from this port.

The original of this was sent via Iviktout, Greenland, to reach an American vessel returning to the United States.

I am, sir, very respectfully, your obedient servant,

D. L. BRAINE,
Commander U. S. N., Commanding U. S. Steamer Juniata, and Senior Officer Present.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES STEAMER JUNIATA, (3d rate,)
Off Upernavik, Greenland, August 11, 1873.

SIR: Having reported the United States steamer Tigress under your command ready in every particular for the search for the United States steamer Polaris, you will be pleased to sail immediately and carry out the instructions of the honorable Secretary of the Navy.

The steam-launch of this vessel sailed from this place August 2, 1873, upon a reconnaissance to the northward, to obtain information, if possible, of the Polaris for the Tigress, with instructions to return in fifteen days, or by the 17th of August, if possible.

You will, upon your route toward Cape York, be pleased to keep a lookout for her, as she may have valuable information for you; and should you fall in with, render her, her officers and crew any assistance they may require; and should she be able to prosecute her voyage of return, be pleased to direct her commanding officer to do so with all despatch to this place, where I shall await him until August 20, at which date I shall leave for Waigatt Strait, to obtain, if possible, coal for this ship. From that point I go to Godhavn, Disco Island, where I shall await the return of the Tigress, under your command, until the latest navigable moment of this year, when I will sail for Saint John's, Newfoundland. You will be pleased to communicate with the above places, should you return this year.

With the sincere hope and wish you may be successful in your search for the United States steamer Polaris, her officers and crew,

I am, very respectfully, your obedient servant,

D. L. BRAINE,
Commander U. S. N., Commanding U. S. Steamer Juniata, and Senior Officer Present.

Commander JAMES A. GREER, U. S. N.,
Commanding United States steamer Tigress,
Off Upernavik, Greenland.

No. 36.] UNITED STATES STEAMER JUNIATA, (3d rate,)
Godhavn, Disco Island, Greenland, August 16, 1873.

SIR: I have the honor to inclose herewith the report of Lieut. George W. De Long, United States Navy, who commanded the search expedition sent from this ship to Cape York in search of the United States steamer Polaris, her officers and crew, to carry information to them, if found, of coming relief, and also to obtain information for the United States steamer Tigress, so she might proceed direct as possible and carry out your orders.

Lieutenant De Long and party encountered very heavy ice near Cape York, and turned to the southward August 9, 1873, in obedience to my

orders, (a copy of which I herewith inclose.) August 12, 1873, the steam-launch (Little Juniata) met the United States steamer Tigress off Tessuisak and imparted to her commanding officer, up to August 9, 1873, valuable information of the condition of the ice, both going to the northward by the coast-line, and returning through Melville Bay.

I beg leave to commend the officers and men who were with Lieutenant De Long upon this extra-hazardous expedition to the favorable consideration of the Navy Department; the former are deserving of acknowledgment and, praise, and in addition thereto, I recommend for the latter medals of honor for fidelity, zeal, and obedience.

I beg leave to report I sailed from Upernavik August 13, 1873, and arrived at this port August 15, where I shall wait to obtain information from both the Tigress and Polaris, or, in case of their arrival here, to accompany them to the United States, in obedience to your orders of June 19, 1873.

The health of the officers and crew of this vessel is, I am happy to say, excellent.

In conclusion, I trust all that has been done by me to carry out your orders will meet with your approbation.

This letter goes forward by the Danish brig Thorwaldsen, via Copenhagen, Denmark, and a duplicate of the same via Iviktout, Greenland, per an American vessel.

I have the honor to be, sir, very respectfully, your obedient servant,

D. L. BRAINE,
Commander U. S. N., Commanding U. S. Steamer Juniata,
and Senior Officer Present.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

P. S.—I also inclose a track-chart of the steam-launch track. I would also state that previous to our leaving Upernavik the ice formed in the fresh-water ponds on shore, and that here at this date we have had storms of snow and sleet, which seem to me to be indications of the approach of an early and severe winter.

D. L. BRAINE.

UNITED STATES STEAMER JUNIATA, (3d rate,)
Upernavik, Greenland, July 31, 1873.

SIR: The Little Juniata, the largest steam-launch of this ship, has been carefully strengthened with outer planking, also with an iron stem-plate, and her propeller guarded with an iron frame. She is thoroughly equipped, arranged, and provisioned for sixty days, under your supervision, for a search for the United States steamer Polaris along the fast in-shore ice to the northward of this place toward Melville Bay. You will assume command of her, and at the first appropriate moment proceed to carry out said search as far as it is positively prudent to advance to the northward.

In navigating these northerly and almost unknown waters much must be left to your discretion, and your movements must be controlled by the short time the United States steamer Juniata will remain at Upernavik, which is until August 25, 1873.

You are enjoined to advise with the ice-pilot furnished you, who has twice passed over the waters you are about to navigate, and wintered in the Arctic frozen regions.

The Little Juniata is not to be jeopardized or pushed into the ice-packs if you meet them; nor is she or the lives of those on board to be involved in any way it is possible to avoid, for you must remember that the United States steamer Tigress, a vessel equipped and prepared for ice-cruising, will soon proceed up Baffin's Bay into Smith's Straits, to search for the Polaris, up to the point she was last seen (Northumberland Island) in October, 1872, and you are reconnoitering previous to her going, possibly to pass an Arctic winter in 77° north.

Should you find the Polaris, or her officers and crew, you will return with dispatch to Upernavik, at which place the Juniata will remain up to the date previously mentioned; and you are not, under any circumstances within your control, to be absent from this ship beyond fifteen days, for which time you have coal, at a daily consumption of 500 pounds.

Should you not find the Polaris by the time you have consumed one-half of your coal, you are to return to Upernavik, and sooner if you meet any formidable ice obstructions.

Should the United States steamer Tigress leave Upernavik before you return, she will be directed to keep a lookout for you, and should you meet her under any circumstances that warrant it, you will remain with her if her commander deems it most prudent you should do so; but should the Little Juniata be able to prosecute the voyage of return to Upernavik, I wish you to do so, and be at that place on or before August 25, 1873.

Should you not be at Upernavik by that date, I will leave there coal and provisions sufficient for your return to Godhavn, Disco Island, where I expect to remain until September 20 or 25, or the latest days previous to the close of navigation by the ice in these waters.

With hopes your search will prove successful and you may find the Polaris, or gain some tidings of her, or be the means of conveying through the Esquimaux to those on board the news of the vessels now in search of her, I sincerely wish you success in your undertaking.

I assure you I shall wait with great interest your return to this ship from the hazardous duty for which you and those associated with you have volunteered.

You will be accompanied by Lieut. Charles W. Chipp, U. S. N.; Ensign Sidney H. May, U. S. N.; Pilot Henry W. Dodge; Richard Street, boatswain's mate; Frank Hamilton, machinist; William King, seaman extra; Martin T. Maher, ordinary seaman.

I am, most sincerely, yours,

D. L. BRAINE,
Commander U. S. N., Commanding U. S. Steamer Juniata, and Senior Officer Present.

Lieut. GEORGE W. DE LONG, U. S. N.,
Commanding the Steam-Launch Little Juniata.

UNITED STATES STEAMER JUNIATA, (3d rate,)
Upernavik, Greenland, August 12, 1873.

SIR: I have the honor to submit to you this my report of an expedition in the steam-launch Little Juniata, under my command, to the northward as far as Cape York, in search of the missing steamer Polaris, which expedition left this ship on the 2d instant and returned at 8 o'clock this evening.

The expedition was prepared by your order, and the necessary detail

of arrangements (such as strengthening the boat with wooden sheathing, fitting a stem-plate of iron, an iron frame or guard for the screw, purchase of canned provisions in sufficient quantities to last eight people sixty days, the internal fittings of the boat with reference to stowage of fuel, &c., the arms and ammunition necessary, spars, sails, and spare machinery) was by you committed to my care and carried forward under my personal supervision during the stay of the ship at St. John's, Newfoundland, and Disco Island, Greenland.

The party consisted of the following-named persons in addition to myself: Lieut. Charles W. Chipp, United States Navy; Ensign Sidney H. May, United States Navy; Mr. Henry W. Dodge, ice-pilots Frank Hamilton, machinist; Richard Street, boatswain's mate; Martin T. Maher, ordinary seaman; William King, ordinary seaman, engineer'; force; and Jacob Lynghe, Esquimaux, who accompanied us as an interpreter and coast-pilot between Upernavik and Cape Shackelton.

On Saturday, August 2, at 12.55 p. m., the boat being in readiness, provisioned, and supplied with four tons of anthracite coal, I received your final orders and shoved off from the ship, with the dingy containing twelve hundred and seventy-eight pounds of coal in tow, and, heartily cheered by the ship's company, proceeded on our voyage to the northward, under steam, with a fine breeze from the southwest.

I immediately organized the party and divided them in two watches, one in charge of Lieutenant Chipp, and consisting of himself, Mr. Dodge, Hamilton, and Street, and the other in my own charge, and composed of the remaining four of the party, the Esquimaux being for the present excluded. This arrangement of watches was kept up during our entire absence, the officers and men working alike, and turning in and out with each other.

At 3.30 the same afternoon we passed the small settlement of Kingitok, about twelve miles to the northward, and working our way among countless icebergs and through narrow passes between islands, arrived without accident at Tessuisak at 11 o'clock that night, and, in obedience to your orders, left the dingy at that place to be brought back by a Danish boat, landed six hundred pounds of coal from her for our use on returning, took the remainder into the launch, and were ready to depart at midnight. The weather, however, had set in bad, blowing fresh from the southwest, with a thick fog, and I deemed it prudent to wait until morning, or until there was some chance of working through the fog with safety.

Tessuisak is a small place of some half dozen Esquimaux huts, besides the house in which the chief trader, Jensen, resides. Jensen is the Dane who accompanied Dr. Hayes on his several expeditions as a dog-driver and hunter, and is apparently an excellent man, speaking English well, and willing and anxious to be of service to Americans, of whom he speaks in the most enthusiastic terms. At his hands we received a warm welcome and such hospitalities as his recent arrival and consequent unsettled condition would permit. Tessuisak has a small harbor, but it is nearly always full of icebergs, and we were forced to anchor among them, too close for comfortable contemplation, and with the chance of any one of them turning over upon us. The night being rainy and comparatively warm, (45°,) many icebergs broke up, and the cracking and breaking and turning over and over continued during our entire stay.

At 10 a. m., Sunday, August 3, the fog having lifted to some extent, we got under way and steamed away to the northward, passing in between Brown Island and the main land, working our way among ice-

bergs, and keeping close in to the main land to keep in smooth water and to be ready to slip in and anchor should a fog overtake us. At 4 p. m. had passed Cone Island and Wedge Island to the westward, and sighted Cape Shackelton and the Horse's Head, a prominent island off this cape, right ahead. Passed to the eastward of the island, and at 8 p. m., having Cape Shackelton close aboard, determined the position of the boat to be in latitude 73° 42′ north, longitude 57° west.

I had calculated before leaving the ship that we should be enabled, with an expenditure of five hundred pounds of coal per day, to make an average speed of four knots per hour under a steam-pressure of twenty pounds, and with the view to keeping the feed-water for the boiler as fresh as possible, a steam-pipe had been carried from the boiler to the water-tank, for the purpose of melting fresh-water ice which we should pick up on the way and put in the tank. We found upon trial thus far that the expenditure of steam to melt the ice was too great to keep up our proposed speed; and I concluded to supply the boiler with salt water, which of course we had to dip up from the water outside. Running with salt water increased our expenditure of fuel, and I now feared that instead of coal for fifteen days, as originally calculated, we would have only enough for eight days. With our sails we may be able to do better should we be favored with fair winds. This day we had light northerly winds, smooth sea; average temperature of the air, 45°; of the water, 41°.

At 4 a. m., Monday, August 4, passed inside of the Duck Islands, Baffin's Island bearing true southeast; weather thick, breeze coming up fresh from northward and westward, and cloudy, with indications of coming fog. This state of affairs continuing, at 3 p. m. I kept the boat away to the eastward, made sail, and stood in for a headland which, from its position and my calculation of the boat's run, I assume to be Wilcox Head, in about latitude 74° 40′ north. In getting under the headland, the fog continuing, we made the boat fast to an iceberg, and waited for a clearing up. At 5 p. m., the fog clearing, we slip from the berg and round the headland to the northward. My object in keeping in close to the shore now, though we were working through icebergs, was to get a sight of the Devil's Thumb, a remarkable pillar of land north of Wilcox Head, and from which I intended to take a fresh departure for crossing Melville Bay. But on rounding Wilcox Head we saw nothing of the Devil's Thumb, and I imagine I might have been deceived in the boat's position in the afternoon. Our accommodations were so limited, the boat had to carry so much, and the difficulty, not to say danger, of getting outside of the boat, was so great that the log could not be hove with any accuracy, and our reckoning was at the best not the most reliable. The currents set us out of our reckoning frequently, sometimes being to the northward and sometimes to the southward.

It is well to note here, for the information of any who may get into Allison Bay, that the chart is wrong in leaving it to be imagined that the bay is free except as to icebergs. It is filled with small islands, running along about fifteen miles from the glacier line, and extending from Cape Seddon nearly fifteen miles to the southward, toward Wilcox Head. It was the presence of these islands which confused us in reference to Wilcox Head.

Discovering another high headland to the northward of the supposed Wilcox Head, I stood on, getting in tolerably open water; and having a smooth sea and no wind, with clear sky, we headed for this new highland. On going below at 8 p. m. I directed Lieutenant Chipp to call me when nearly up with this headland, or in case of any change in the

weather. At 10 p. m. Lieutenant Chipp called me, a fog having shut in, the land being entirely obscured, and much ice being encountered in the shape of pack-ice and icebergs, and some new ice an inch in thickness. I immediately put about and attempted to retrace our way, which we succeeded in doing for several miles, but finally, owing to the increasing thickness of the fog, we missed our track, and were brought to a standstill in the pack. As far as we could see we were caught in solid ice, about from one to two feet thick, with large hummucks and icebergs surrounding us. By steady ramming of the ice and working a clear space about us, we occasionally made small cracks in the floes, and succeeded in forcing our way a little at a time, getting occasionally in open patches of water, and among loose ice, and making two or three miles before being brought up again by solid ice. I had headed the boat to the westward on losing our way in the ice, and I knew that every foot we made in that direction was toward the open water. The temperature was from 30° to 32°, the rigging was covered with ice, and the new ice was rapidly forming around us and increasing in thickness. I did not dare to stop for a clearing up of the fog, lest we should be firmly frozen in, and so kept the boat under way with full steam pressure, grinding through the ice where we could, ramming it wherever there was a chance of success, and following every little lead to the westward.

In all this I was guided by Mr. Dodge, the ice-pilot, whose previous experience in the Arctic regions enabled him to give me good advice, and upon whose judgment in this emergency I relied, and handled the boat accordingly. The plan of keeping to the westward proved a wise one, for at 8.30 a. m. we were rewarded by coming into quite large spaces of open water, and at 9 a. m., were pleased to detect a little swell, giving indications of our approach to the open sea beyond. By 10 a. m. we were quite clear of the pack after our twelve hours of uneasiness, and with no more damage to our little craft than a slight scratching and splintering of our strengthening plank, occasioned by the new ice through which we forced during the night.

I immediately headed the boat to the northwest true, (northeast magnetic,) and the fog clearing up by noon, we sighted at 2 p. m. three islands on our starboard quarter, the Sabine Islands, marked on the chart as being in latitude 75° 28′ north, longitude 59° 55′ west. At the same time made out the glaciers beyond to the northeast, a large number of icebergs, and a curious looking hill with two peaks, which no doubt is the Cape Walker marked on the chart, or land in its immediate vicinity. Generally speaking, the chart is inaccurate to a great extent to the northward of Cape Shackelton—the coast-line as we found it being nearly always a glacier line. To the best of our ability to see and judge, the ice-pack was tolerably solid from these Sabine Islands to the coast, showing that we were not far removed from the edge of the Melville Bay pack. The entire bay was dotted with clusters of icebergs.

Between 4 and 6 p. m. we were favored with a light fall of snow, the thermometer standing at 42°, with a light southeast wind and swell.

Knowing that everything that could be accomplished by the boat must be done in fine weather, and that it would be well to keep a hold on the land as much as possible, owing to the uncertainty of our position and the inaccuracy of the chart, I determined to push on with greater speed, in order to be near the land as possible, which was at its nearest point about fifty miles distant, and to this end fired up afresh, making a large hole in our fuel.

At 8 o'clock the next morning, Wednesday, August 6, we had no land

in sight ahead, but we found ourselves on the edge of the ice-pack, with a thick fog shutting in and no signs of a lead through. At about 11 a. m. land showed itself abeam, bearing northeast true, in the shape of two high hills, which Mr. Dodge recognized as the Peaked Hill, marked on the chart as being in latitude 76° 18′ north and longitude 62° west. Just as we sighted this land Mr. Dodge discovered a lead in the pack to the westward; but the fog shutting in thicker than ever, we were unable to follow it, and I decided to anchor to an iceberg rather than risk the boat on the edge of the pack. We accordingly made our ice-anchor fast at 1 p. m., but discovering the berg to be full of cracks and looking very much like breaking up, I shifted our anchorage to a small ice-cake and banked fires.

At this point I took an account of fuel remaining, and calculated that it was very nearly half gone. We had accomplished this distance without any more serious mishap than our danger of being firmly caught in the ice in Allison Bay. Cape York was only forty miles off, and the people of the Polaris might be there waiting for relief. In the foggy state of the weather burning coal without advancing would be a waste of fuel, and I decided to let the fire go out under the boiler, hoping to accomplish something under sail should the fog lift, or a chance present itself of getting open water to the northward. Accordingly, in the morning of Thursday, August 7, we let the fire die out. The thermometer was at this time at 38°, but we suffered no additional inconvenience on that account.

During the forenoon it promised several times to clear up, the sun showing itself occasionally for a few moments, but with little or no effect on the fog. Becoming tired of inaction, we slipped from the ice at 9.45 a. m., and, making sail, stood to northwest with a light southeast wind and swell.

At noon I determined the position of the boat to be in latitude 75° 52′ north, longitude 64° 05′ west, by our dead reckoning, and the last bearing we had of the land in the neighborhood of the Peaked Hill. At 4 p. m. came in sight of the ice-pack again, and immediately hauled the boat up to west-northwest true. Discovering a lead in the pack to the northward and westward, stood into it for about five miles, until Mr. Dodge pronounced it a false lead, the ice closing in ahead about four feet thick, some being last year's ice and some older. Brought by the wind and beat out of the lead. At 8 p. m. the wind freshened from south-southeast, and we commenced to work to the westward, as much as possible keeping clear of the ice. At midnight hauled alongside of an iceberg to fill up with fresh-water ice for drinking and cooking. Moderate sea.

At 1.30 a. m., Friday, August 8, sighted high land bearing northwest by north true, and trending away to the northward in an apparently low neck. This, Mr. Dodge pronounces our anxiously looked for Cape York; and at 2.30 a. m., having worked clear of detached pieces of floe-ice, stood in toward the land, which we calculated to be about eight miles distant. At 3 o'clock a. m. the fog shut in again thick and we lost sight of Cape York, at the same time the wind freshened to a gale from southeast and I was compelled to bring the boat by the wind and reef down as snug as possible. At this time had we been in open water, Cape York could have been reached without any difficulty, but as far as we could see to the northward the ice was in a solid pack three to four feet thick, and we were struggling along on the edge of it looking for a lead, and working to the westward in so doing. To the northeast the ice was also in a firm pack, with icebergs and hummocks close enough

together to prevent the opening of the ice to any extent. At noon I established the position of the boat in latitude 75° 48′ north, longitude 66° 50′ west.

In the afternoon the southeast gale had caused a fearful sea, and working as we were on the edge of the ice-pack, our situation became one of great danger. The wind had started the Melville Bay pack out from the land to the northward and westward, making a regular bight, in which we were fairly placed. We had to carry sail in order to keep the boat under control. Steam would have been of no use, since the little Juniata could not for one moment have steamed against such a gale. Lying to was not to be thought of, lest we should drift to the pack and be ground to pieces. The prospect at this time was a terrible one. Icebergs near us, 100 feet in height, had the spray from the sea thrown over their tops. On approaching the edge of the pack-ice, we could see a scene of great confusion. The bordering ice would be broken in large pieces and hurled upon the more solid ice, only to be displaced by fresh pieces torn adrift by the gale and rolled over and over upon the face of the pack. The fate of the boat and the party appeared certain. We were half buried in the seas at times, shipping quantities of water and deluging everything in the boat. It rained in torrents. Had our sail split or our mast gone, nothing could have been done. Providentially everything held, and we were enabled to keep the boat under some control. The fog was very thick, making it extremely difficult to see the ice-pack each time, until we were fairly alongside of it, in which case we had to wear ship at once without delay, not knowing in so doing whether we could clear this grinding aud crushing mass of ice or not.

This state of affairs continued until 10 o'clock on the morning of Saturday, August 9, at which time there came a lull. We had then been in this heavy gale thirty hours, and were in a very cold and exhausted state. Everything was completely saturated with water, and we had so much water in the boat that I feared she had sprung aleak. The Little Juniata behaved wonderfully well, and did more than such a small craft could have been expected to do. With our fire-room flooring covered with water, the coal-bunkers half full of the same, every locker in the boat afloat, all our baling would have made no impression on this bulk of water, which was constantly increased by the seas shipped at every one of the fearful plunges of the boat and the showers of spray thrown over us.

We hailed with great relief this lull in the wind which gave promise of a breaking up of the gale, and fearing for the safety of the boat, should the wind subside, leaving this fearful sea running, we attempted to get fire lighted under the boiler. This was no easy matter, and for a while seemed impossible. The matches we had taken with us were wet and useless. The tinder was likewise saturated and of no avail. After several hours' work we succeeded in getting a friction-match dry enough to ignite, Ensign May having warmed and dried it by keeping it next his body for that purpose, and with this match we lighted a candle in a lantern, which was almost immediately extinguished by a gust of wind. By a repetition of the same process, Mr. May secured another lighted match, and this time we succeeded in keeping our candle alight. We attempted then to build a fire, but every stick of wood was soaking wet. By taking cotton waste and junk, wet as they were, and pouring oil plentifully over them, we succeeded at last in lighting our fire.

During this time the wind had moderated and hauled to the southwest. I calculated the boat to have been in latitude 75° 48′ north, longitude 68° 30′ west, on the port tack, (wind at southeast true,) and longitude 67° 10′ west on the end of each starboard tack. We had been running on a line nearly east and west during the gale, making about twenty-five miles on each tack before wearing ship, and obliged to go over nearly the same ground on account of icebergs, luffing to the wind as occasion served or required.

At this point I was forced to the conclusion that prosecuting the search any longer was out of the question. My orders read positively to return when the fuel was half expended, and on no account to risk the boat in the ice-pack. The fuel was half gone, and what was left was in such a condition as to lead to very grave doubts as to its being reliable for steaming on the return. As far as we could see to the northward and eastward was pack-ice, and it was in this direction that our port lay. I did not know how close to the middle pack we had been blown during the gale, and I feared if the wind came out in the northwest, we would not only be blown down upon the Mellville Bay pack, but be followed by detached portions of the middle pack and caught firmly between the two. Again, if we had succeeded in working our way through a lead in toward the land, and had reached it, we had not fuel enough to work our way back through the pack-ice, supposing that a northwest wind had not closed us in for the year.

Up to this time we had seen nothing of the Polaris or of her people Had they been at Cape York, it would not have added to their chances of safety had our little party increased their number, with the ice effectually closing our means of exit. Anxious as we were to find them, and tell them of relief coming, I could not further risk our party being caught in the ice in an open boat, with the season closing, new ice forming, and only fuel enough to keep us warm for a few days. I did not know how far the United States steamer Tigress was behind us, nor what our chances would have been of her rescuing us had we been frozen in. The weather was uncertain, another gale like our previous one was by no means unlikely, and my orders expressly forbade me to jeopardize the lives of the party by putting the boat in the pack-ice.

Reluctantly, therefore, I was compelled to announce that the search must be given up, and headed the boat to the southeast on our return, having steam enough to go ahead at 4 p. m. Having gone up on the in-shore track, I concluded to return by the off-shore or mid-channel track, in hopes that we might see something of the Polaris or her people, but in this we were not gratified.

The wind continued hauling to the westward, soon reducing the southeast swell, and creating a swell from the northwest. Before this we went along at a good rate, the weather clearing gradually, the ice-pack disappearing astern.

Sunday, August 10, opened clear and pleasant; so continuing till past meridian. For the first time since leaving the ship I succeeded in getting observations, and established the boat's position at noon in latitude 74° 45′ north, longitude 59° 37′ west, having run nearly one hundred and fifty miles during the preceding twenty-four hours.

At 1 p. m. sighted the Devil's Thumb, bearing true northeast by north, distant about sixty miles, verifying our position at noon with tolerable accuracy. The weather here became cloudy and squally from west-southwest, with snow, hail, and rain. Wind shifting again at 4 o'clock to southwest, with moderate sea, and so continuing till 9 p. m., from which time to midnight we had light, variable airs.

Monday, August 11, opened clear and pleasant, with freshening breezes from northeast. At 4 a. m. sighted land on port bow, which I recognized as Cape Shackelton, and at 5.30 a. m. sighted the Duck Islands on port beam. This day and the day previous we had considerable trouble with our fires. Knowing that we were short of fuel we economized as much as possible, and were sometimes rewarded by the engine stopping itself for want of steam.

At noon got our latitude by meridian altitude of the sun to be 73° 38′ north, or on the parallel of the Horse's Head, which now showed itself on our port beam. We then headed in for Brown Island, off Tessuisak, favored with a fine breeze from north-northwest with long swell, which led me to think that the weather had been unsettled after our departure from Cape York. At midnight we were inside of Brown Island, heading in for Tessuisak.

At 1 a. m., Tuesday, August 12, sighted Jensen's house, and discovered a steamer, apparently at anchor, in the harbor. She immediately thereafter steamed out toward us, and coming alongside of us proved to be the United States steamer Tigress, Commander James A. Greer, from Upernavik the previous evening. I boarded her, and communicated to Commander Greer the result of our reconnaissance, imparting to him the circumstances of wind, weather, ice, and other details relating to his coming journey, up to 4 o'clock on the afternoon of Saturday, August 9, at which time we left the neighborhood of Cape York. I exhibited to him my chart, showing our track going and returning; reported to him the prevalence of pack and new ice in Allison Bay, and respectfully recommended him to strike to the northwest from Cape Shackelton, instead of looking for the Devil's Thumb.

I also offered him the services of our entire party and boat, expressing our willingness and readiness to accompany him to the northward in his search for the Polaris, which services, to our great regret, he declined. Receiving from him his mail and dispatches for you, I left the Tigress at 2 a. m., she immediately steaming to the westward to round Brown Island, and the Little Juniata steered in for her anchorage in front of Jensen's house.

The people of the Tigress were all well, in good spirits, and enthusiastic as to their success, which we heartily wished them in spite of our disappointment.

At 8.40 a. m., having received on board the six hundred pounds of coal left with Jensen on the 2d, and having received from him some seal blubber, in case we ran out of coal, we got our anchor and steamed away, passing among the same islands, and through the same channels, as in going north, and, favored with fine weather and smooth sea, reached the ship without any mishap at 8 p. m. to-day, and were warmly received and welcomed back by you and the other officers assembled at the gangway.

It now remains for me to hope, in submitting this report to your consideration, that my conduct in the affair will meet with your approbation, and that though we were unsuccessful in the endeavor to find the Polaris or her people, no means were left untried that the nature of the difficulties met with and the limited ability of our boat would allow. I believe the Little Juniata to have accomplished more than was expected of her in reaching the parallel of 75° 52′ north, there successfully working through a gale of great violence, and running nearly seven hundred miles while away from the ship. With the limited chances for keeping a reckoning, owing to the thick, foggy weather,

and the constant discomfort of being in wet clothing, with every article in the boat drenched by the rains or by the waves breaking over her, I fear that this report will not prove as satisfactory for navigation purposes hereafter as would be desired.

I have made this report to you in detail, omitting no circumstance, however slight, that a fair general idea might be obtained of the circumstances of Arctic navigation in an open boat, even at this the most favorable season of the year.

From our experience I have no hesitation in saying that pack-ice is to be experienced from Allison Bay in-shore to Cape York, and for some miles to the westward of that place; that its location with reference to the shore is dependent on the winds, which are at best uncertain; that a lead in the pack with one wind may as surely be a trap in which a boat can be caught in another wind; that at this season even, new ice an inch in thickness will form in a single night, as per our experience in Allison Bay on August 4; that even the edges of the pack-ice were three feet and more in thickness, making it extremely difficult, if not impossible, for a powerful steamer to work her way through in safety; that a gale of wind in this region is always attended with danger if in the neighborhood of pack-ice. It may be that we are giving no new information on this subject, but our experience may be of service to some future expedition in which a reconnaissance may be made in boats.

I have to commend to you in the most favorable terms, Lieutenant Chipp, Ensign May, and Mr. Dodge. To the coolness and good judgment of Lieutenant Chipp I am indebted for much assistance in carrying on the work of the expedition, and for the zeal manifested in circumstances of great personal discomfort and in the face of dangerous difficulties, he could not have been excelled. Ensign May also performed his duty with ability and zeal, untiring in his work to the end. Of Mr. Dodge and his valuable assistance I have before spoken, and it gives me great pleasure to certify to his practical knowledge of the ice and its location, and the best ways of avoiding it, as well as to the cheerfulness and readiness with which he bore his part of the labors of handling the boat, tending fires, steering, &c., as well as going without rest repeatedly when our proximity to the ice made it necessary for me to have him on deck at all times, to profit by his information and previous experience.

I have to call to your favorable notice Frank Hamilton, machinist, Richard Street, boatswain's mate, Martin T. Maher, ordinary seaman, and William King, ordinary seaman, engineer's force, all of whom volunteered for the expedition, and who performed their duties well, being animated by the same zeal as the officers in reaching Cape York, as long as there was a chance of our being of service to the Polaris or her people. And I respectfully request that you will make such mention of these men to the honorable Secretary of the Navy as their voluntary services in a hazardous expedition may seem, in your judgment, to have entitled them.

Throughout this trip the officers and men worked alike and fared alike, and as we are unanimous in our regret that as far as finding and relieving the Polaris was concerned we failed, we beg to assure you we are of one voice in volunteering for any subsequent expedition from this ship or from the United States, in which our efforts can be made useful, or our experience in the Little Juniata of any effect.

I cannot close this report without commenting upon the great interest taken in the matter by yourself, the provision made for our comfort, and

your thoughtful care that nothing should be wanting to insure our safety and the success of the expedition.

I have the honor to be, captain, very respectfully, your obedient servant,

GEORGE W. DE LONG,
Lieutenant U. S. N., late Commander Little Juniata.

Commander D. L. BRAINE, U. S. N.,
Commanding United States Steamer Juniata.

No. 37.] UNITED STATES STEAMER JUNIATA, (3d rate,)
Godhavn, Disco Island, Greenland, August 18, 1873.

SIR: I have the honor to inclose herewith, for the information of the Navy Department, a copy of a communication received by me from Commander James A. Greer, United States Navy, commanding United States steamer Tigress, and which contains the latest intelligence of that vessel since her sailing from Upernavik for the northward. The original of this was sent via Iviktout, Greenland.

I am, sir, very respectfully, your obedient servant,

D. L. BRAINE,
Commander U. S. N., commanding U. S. Steamer Juniata, and Senior Officer Present.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

TIGRESS, OFF TESSUISAK, *August* 12—10 m.

We have just arrived, my dear Braine, and I send this by the pilot. Please send the inclosed to the United States by the first good opportunity. If you desire to see icebergs, take a run up as far as Kingitoke and your curiosity will be satisfied. I had my first bump to-day; could not be helped, as it was a choice between rocks and bergs. No damage done; sensation novel. Hear nothing of De Long.

Yours, very truly,

JAMES A. GREER.

Commander BRAINE,
Commanding United States Steamer Juniata,
Upernavik Greenland.

My confounded engine got on center again; ran easily on a smooth rock; backed off with no damage. Governor Jenson is going to pilot us clear of the island. I have just met De Long on his way back; I send this by him at 1.30 m. All well.

Yours, &c.,

JAS. A. GREER.

UNITED STATES STEAMER JUNIATA, (3d rate,)
Harbor of Saint John's, Newfoundland, September 13, 1873.

SIR: I have the honor to report the arrival at this place of the United States steamer Juniata, under my command, ten days from Godhavn, Island of Disco, Greenland:

August 31, at 9.30 a. m., I sailed from Godhavn, taking a course down the middle of Davis Strait, passed Cape Walsingham and Cum-

berland Sound, Frobisher's and Hudson's Straits, crossing the track of whalers on their return. Most of the passage from Godhavn here was performed under sail alone and in very stormy weather, and here I would beg leave to state that from August 10, at Upernavik, at which date we had our first snow, until our departure from the Greenland coast, the weather was boisterous, with heavy gales, with ice, hail, and snow, the latter falling 10 to 18 inches of a night, with all the indications, as stated by the residents of Godhavn, of an early and unusually severe winter.

I beg leave to refer to my letter No. 36, under date of August 16, 1873, wherein I informed the Department of my intent, under your instructions, to wait at Godhavn for the United States steamers Tigress and Polaris.

I had sent to the Waigatt mines our steam-launch, Ensign J. D. Keeler in charge, with the intent of getting coal for this ship, the Tigress, and Polaris; when, August 25, at 3 a. m., the Tigress arrived at Godhavn, having been, between August 11 and 25, to Littleton Island, (latitude 78° 25′ north, longitude 73° 46′ west,) and found (Commander Greer reports) the camp of the Polaris, near said island, upon the main land; for particulars of which I refer you to Commander Greer's report, which I herewith inclose; also copies of telegrams sent from here.

About meridian, August 25, the Tigress, having in the meantime been coaled by me, sailed to make further search along the Labrador coast for the officers and crew, whom she had not as yet rescued.

Before sailing, Commander Greer was informed by me that at Iviktout, Greenland, about latitude 61° north, arrangements had been made by which he could obtain a supply of coal, (he was furnished with a chart of that harbor,) and I advised him to take advantage of it, for, with that coal, he could continue his search to the northward and westward. When he left Godhavn, Disco Island, he had coal for twenty-eight days' full steaming, and if he were to use it continuously his supply should not be exhausted until September 22. Before Commander Greer, in the Tigress, left Godhavn, Island of Disco, on the 25th of August, I suggested to him that he had better return to Godhavn and again meet the Juniata; he informed that he did not intend to return to Godhavn; did not need the services of the Juniata any more; did not desire me to remain there any longer with the view to assist him in any way, and that he intended to proceed to Saint John's, Newfoundland, after his search was concluded to the west side of Baffin's Bay and Davis Straits.

After the Tigress sailed I waited at Godhavn nearly six days, in the meantime recalling the officers and men who were at the coal mine.

The Department's telegraph dispatch (in response to the one sent by me of the Polaris, as reported by the Tigress) was received September 11.

I am coaling with dispatch, and in a day or two will complete the required repairs to the engines and boilers of this vessel, and shall sail in search of the crew of the Polaris, in obedience to the Department order "to continue the search."

I am happy to state that the health of the officers and crew of this vessel is excellent.

I am, sir, very respectfully, your obedient servant,

D. L. BRAINE,
Commander U. S. N., commanding U. S. Steamer Juniata,
and Senior Officer Present.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

[Telegram.]

SAINT JOHN'S, NEWFOUNDLAND, *September* 10, 1873.

HON. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C., United States.

Juniata arrived to-day; met Tigress at Upernavik; coaled her. She sailed August 11 for Littleton Island. Tigress met Juniata steam-launch, Lieutenant De Long, off Tessuisak, who had been to Cape York in launch and returned. At Disco met Tigress again; again coaled her. August 25, Commander Greer reports: "Camp of Polaris found August 14 off Littleton Island, (latitude 78° 23′ north, longitude 73° 46′ west;) crew of Polaris all well; had gone south two months before in two whale boats made of ship. Polaris sank one month after. Kept careful lookout, going north and coming south; no signs. Stopped at all settlements; no news. Crew of Polaris probably on board of whaler from Cape York. Tigress left Disco August 25 for Labrador coast, to continue search as long as coal and season permit."

D. L. BRAINE,
Commander United States Navy.

[Telegram sent from Saint John's, Newfoundland, September 11, 1873.]

Commodore WILLIAM REYNOLDS, U. S. N.,
Acting Secretary Navy, Washington City, United States.

"Dispatch received; will coal and sail immediately; should I meet Tigress will instruct her continue search of Polaris crew, still missing."

D. L. BRAINE,
Commander United States Navy.

[Telegram from St. John's, N. F.]

GEORGE M. ROBESON,
Secretary Navy, Washington:

Juniata not fit or fortified sufficiently to proceed north at this late season. Captain Braine bound to sail at once. At the recommendation of experienced sealing masters of this port, would advise not to proceed. Five steamers now whaling north, and looking for them. Orders to come home after 5th September, fearing chance of being frozen up.

THOS. N. MOLLOY,
United States Consul.

[Telegram.]

NAVY DEPARTMENT,
Washington, September 13, 1873

Consul MOLLOY, *St. John's, N. F.:*

Telegram received. The Department hopes Juniata has gone north in compliance with her orders.

WM. REYNOLDS,
Acting Secretary of the Navy.

[Telegram.]

NAVY DEPARTMENT, *September* 10, 1873.

Commander D. L. BRAINE,
Commanding United States Steamer Juniata, St. John's, N. F.:

Dispatch received. Continue to search for crew of Polaris.

WM. REYNOLDS,
Acting Secretary Navy.

[Telegram.]

Commodore WM. REYNOLDS,
Acting Secretary Navy, Washington City, U. S.:

Dispatch received. Will coal and sail immediately. Should I meet Tigress, will instruct her continue search if Polaris crew still missing.

D. L. BRAINE,
Commander United States Navy.

ST. JOHN'S, N. F.

[Telegram.]

GEO. M. ROBESON,
Secretary Navy, Washington, U. S.:

Yesterday started north to search as ordered. Midnight overhauled by steamer Safety. Polaris crew rescued by English steamer Arctic. Telegraphed from Dundee, Scotland; reported by American Consul Molloy to me. Returned to port this day.

D. L. BRAINE,
Commander United States Navy.

ST. JOHN'S, *September* 19, 1873.

[Telegram.]

NAVY DEPARTMENT,
Washington, September 19, 1873.

United States Consul MOLLOY,
St. John's, Newfoundland:

Dispatches of yesterday and to-day received. Thanks for your attention.

WM. REYNOLDS,
Acting Secretary of the Navy.

[Telegram.]

ROBESON,
Secretary Navy, Washington, U. S.:

Steamer Hector, whaler, arrived from Uiantihek Harbor, Cumberland Inlet. Sailed thence September 17. Tigress left above place 16th, going to Poiktout, Greenland, for coal, thence to track of homeward-bound whalers. Greer told Captain Hector, if he did not get information of Polaris or people, will be at St. John's about middle of October.

D. L. BRAINE,
Commander United States Navy.

ST. JOHN'S, *September* 25.

[Telegram.]

SECRETARY NAVY, *Washington, D. C.:*

Whaling steamer Hector arrived. Report Tigress at Uiantihek, Cumberland Sound. All well 15th September. Will cruise to end of October to intercept Scotch whalers.

MOLLOY,
United States Consul.

DEPARTMENT OF STATE,
Washington, September 19, 1873.

SIR: A telegram has just been received from Mr. William Reed, vice-consul of the United States at Dundee, Scotland, stating that the "Polaris expedition arrived here destitute. Crew saved, awaiting orders; telegraph." There being no fund at the disposal of this Department from which the wants of these seamen can be relieved, I have the honor to request you to advise me of the action to be taken in the matter.

I have the honor to be, sir, your obedient servant,

J. C. B. DAVIS,
Acting Secretary.

Hon. GEORGE M. ROBESON,
Secretary of the Navy.

NAVY DEPARTMENT, *September* 19, 1873.

SIR: I have the honor to acknowledge the receipt of your letter of this date, in relation to the arrival of the crew of the Polaris at Dundee.

The Department would be glad if you will telegraph at its expense to the United States consul at Dundee to make proper provision for the comfort of the people of the Polaris and send them to the United States by the first steamer, and draw on this Department for the amount expended on this account.

Very respectfully,

WM. REYNOLDS,
Acting Secretary of the Navy.

Hon. J. C. B. DAVIS,
Acting Secretary of State.

DEPARTMENT OF STATE,
Washington, September 19, 1873.

SIR: Upon the receipt of your letter of this date respecting the arrival of the crew of the Polaris at Dundee, I telegraphed to the vice-consul there as follows: "Provide for the people of the Polaris and send them to the United States by first steamer. Draw on Secretary of Navy for expenses."

Since that telegram was sent the following has been received from General Badeau, consul-general at London, which I communicate for your information, viz:

Polaris expedition arrived at Dundee. Buddington and scientific men want money. Shall it be supplied?

I have the honor to be, sir, your obedient servant,

J. C. B. DAVIS,
Acting Secretary.

Commodore WILLIAM REYNOLDS,
Acting Secretary of the Navy.

NAVY DEPARTMENT, *September* 20, 1873.

SIR: I have the honor to acknowledge the receipt of your letter of the 19th instant, in relation to a telegram from the consul-general at London, respecting the survivors of the Polaris expedition.

I will thank you to authorize the consul to supply the officers with two hundred or three hundred dollars each, and the men from fifty to one hundred dollars apiece, as they may desire, on account of their pay, and draw on the Department for the amount.

Very respectfully,

WM. REYNOLDS,
Acting Secretary of the Navy.

Hon J. C. B. DAVIS,
Acting Secretary of State.

DEPARTMENT OF STATE,
Washington, September 20, 1873.

SIR: I have the honor to acknowledge receipt of your letter of this date respecting advances to be made to the officers and men of the Polaris.

The following telegram has been sent to the consul-general at London:

Supply officers with two or three hundred dollars each, and men from fifty to one hundred dollars each, on account of their pay, and draw on Secretary of Navy, unless consul at Dundee has already done so under instructions of yesterday.

I have the honor to be, sir, your obedient servant,

J. C. B. DAVIS,
Acting Secretary.

Commodore WILLIAM REYNOLDS,
Acting Secretary of the Navy.

[Telegram.]

NAVY DEPARTMENT, *September* 19, 1873.

Commander BRAINE,
Juniata, St. John's, N. F.:

Await at St. John's arrival of Tigress, and then return to New York.

WM. REYNOLDS,
Acting Secretary Navy.

No. 45.] UNITED STATES STEAMER JUNIATA, (3d rate,)
Harbor of St. John's, Newfoundland, September 14, 1873.

SIR: I have the honor to inclose herewith to the Department for your information copies of reports made to me by Ensign J. D. Keeler, and Second Assistant Engineer H. E. Rhoades, attached to this ship, in regard to the coal-mines at Waigatt Strait, Disco Island, Greenland, to which an expedition was sent to obtain coal for this ship.

Very respectfully, your obedient servant,

D. L. BRAINE,
Commander United States Navy,
Commanding U. S. Steamer Juniata, and Senior Officer Present.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES STEAMER JUNIATA, (3d rate,)
Godhavn, Disco Island, August 30, 1873.

SIR: I have the honor to submit the following report of the cruise of the steam-launch Little Juniata, to obtain information respecting the possibility of procuring coal on this island, from the mines in the Waigatt, distant about ninety miles from this place, and to mine coal for this ship, if possible.

In obedience to orders received from yourself, I took charge of the steam-launch Little Juniata, having on board the following officers: second assistant engineer, H. E. Rhoades; gunner, M. K. Henderson; captain's clerk, G. J. Marbury; pilot, H. W. Dodge; and twelve men, with mining implements and provisions for fifteen days; and at 6.15 p. m. on the 23d of August I left this vessel, having in tow the Danish sloop Three Sisters, with the intention of bringing her back loaded with coal, provided we could mine successfully, and if she was not detained by the Danish authorities at Rittenbenk. I arrived at that place at 3 a. m., August 25, and at 5.30 a. m. went on shore and communicated with the governor of the place. I found that the sloop would be delayed for some hours, as she had cargo to discharge, and therefore made arrangements with the governor to have the sloop follow me as soon as her cargo was landed, and at 11.45 a. m. of the same I got under way and stood for the settlement Njaiasusak, having in tow a small schooner, with eleven Esquimaux on board, whom I had engaged to assist me in mining, and one of whom, the governor assured me, knew the location of the mine. I left a quantity of provisions in the sloop, with Mr. Marbury in charge. As we were leaving the harbor, we met a sloop from Egedisminde, and upon hailing her was informed by her captain that he had orders to report to the governor of Rittenbenk for our use in transporting coal.

At 8 p. m. we arrived off Njaiasusak, came to anchor, and communicated with the trader of the station, from whom I learned that we could procure more Esquimaux help from his station if we should need it.

There being indications of bad weather, upon learning that there was no harbor near the mine, I set an anchor-watch, and arranged for the remainder of the crew to sleep on shore. The next day, at 10.25 a. m., I got under way and started for the mines. Owing to our inability to speak the Esquimaux language, we were unable to communicate freely with our pilot, who, it afterward appeared, had been misled by depending upon the assumed knowledge of some of the natives, hunters at Njaiasusak.

At 3 p. m., by the advice of the pilot, we came to anchor about sixteen miles above Njaiasusak, and accompanied by second assistant engineer, H. E. Rhoades, and the pilot, I went on shore, but we failed to find indications of coal in any quantity. I then asked the pilot if he knew the place where the Three Sisters had taken her last cargo of coal. He answered affirmatively, and I then ordered him to take me to that place, which he did, and at 6.15 p. m., August 26, we came to anchor about six miles above Njaiasusak. Accompanied by Mr. Rhoades, I went on shore again and found several veins of coal that had been partially opened by the natives. The inspection proving satisfactory, I immediately landed implements, provisions, and men, and organized camp. The vein in which we decided to commence mining is quite near the beach, and about one hundred feet above the level. I afterward opened another vein, also near the beach, as I found that by so doing I could work my men to better advantage. We commenced

work at 5.30 a. m., August 27, and having removed sand and rubbish, at 7 a. m. commenced taking out coal. After having worked nine hours I found that we had taken out and placed upon the beach, ready for embarking, fifteen tons of coal. The force employed was eleven men (two of them natives) mining, and nine Esquimaux (men and women) engaged in bagging the coal and carrying it to the beach.

Owing to the slowness or incapacity of the captain of the sloop, she had not yet arrived at the mines, and I was therefore obliged to content myself with having the coal already for shipment.

The implements which we employed in mining were picks, shovels, and chisel-bars, and I found them fully efficient for the work. At 8.40 a. m., August 28, I received orders from yourself, per kayak, to return to this vessel with all dispatch. I immediately struck my camp and embarked men and implements in the steam-launch, carrying only sufficient provisions to enable me to reach the ship, and embarking all the coal I possibly could, amounting to thirty-eight bags, fourteen of which remained in the launch when we reached the ship. The remainder of my provisions I embarked in the schooner and sent to Rittenbenk, consigning them to the care of the governor of that place, and made all haste to reach this place, where we arrived at 12 meridian, August 29, having been absent from the ship five days and eighteen hours. The veins of coal which we worked were of from 15 to 30 inches in thickness, and I noticed that the coal became of better quality as we worked into the hill. I believe that a force of one hundred men could easily mine and embark fifty tons of coal per day in ordinary weather, for I think that, except in gales of wind, the surf is never so heavy as to prevent ship's boats from landing and carrying off loads; if necessary, a small wharf could be easily constructed, as there is plenty of stone near by. In case of heavy weather, a vessel using steam-power could easily find a lee from wind of any direction. The harbor of Rittenbenk is only forty miles from the mine, bearing about E.S.E., (true) the land on the N.E. side of the Waigat is very high and would afford a protection against N.E. winds, even at a long distance from the shore; the width of the Waigatt at this point is about twenty-five miles. Flakkenbenk, the S.E. point of Disco Island, forms a protection against winds from N.W., and Rittenbenk harbor is perfectly protected from S.E. gales.

I noticed a constant current to the northward and westward setting through the strait, and found the whole of the Waigat, as far as I could observe, entirely clear of pack and floe-ice, although icebergs were quite numerous.

Native help may be easily obtained, and at reasonable rates, the usual price being one-half of a Danish dollar (about 28 cents,) per day, and rations.

The only shelter we had or needed at the mines were the canvas tents we took from this ship, and all enjoyed the most perfect health. In conclusion, I have the honor to express it as my opinion that coal can be procured at the Waigat mines in sufficient quantities, and with reasonable outlay of time and labor.

I am, sir, very respectfully, your obedient servant.

JOHN D. KEELER,
Ensign United States Navy.

Commander D. L. BRAINE, U. S. N.,
Commanding United States Steamer Juniata, (3d rate,)
Godhavn, Disco Island, Greenland.

UNITED STATES STEAMER JUNIATA, (3d rate,)
Godhavn, Disco Island, Greenland, August 30, 1873.

SIR: I have the honor to submit the following report of my observations of the coal recently mined by the expedition sent by you in the steam-launch Little Juniata to the coal-mines, on the north side of this Island, and about ninety miles distant from this place.

At 6.15 p. m. of the 26th instant we arrived at the coal mine about six miles beyond Njaiasusak, a small settlement or hunting station. Ensign J. D. Keeler, who was in command of the expedition, and myself went on shore to prospect, and found three veins of coal that had been barely opened by the Esquimaux. The best vein of the three was about 2½ feet in thickness, running longitudinally through the mountain, only a few feet back from the beach, and about 100 feet above the level.

On top of this vein of coal were three strata, viz: one stratum of sand about 6 feet thick, another of black plate clay about 3 feet thick, and another of sand about 6 feet in thickness. The latter was immediately on top of the coal, very hard and occupied at least one-third of our time in removing it from the coal.

At 7 a. m. of 27th we commenced work, and in nine hours took out about fifteen tons of coal, and piled it on the beach, ready for embarkation in the sloop as soon as it arrived. The tools we used, which proved efficient and sufficient, were a dozen common pick-axes, a half dozen chisel-bars, and a dozen shovels, using the latter only for removing the sand. The mining was done by nine of our men and two Esquimaux, and the coal carried in bags, made of hide, by nine other Esquimaux to the beach. In the afternoon we divided our party into two separate gangs, and worked upon two separate veins, both veins being near at hand.

Next morning we found that the strata overlaying the coal had broken away and slid down, filling up our working ledge, which sand had to be removed before we could continue work. This was done after a half-hours' labor, and we resumed work upon the vein. As we advanced into the vein I noticed that the coal gradually assumed a blacker and brighter hue, indicating the presence of bitumen, and some lumps were sprinkled with small particles of resin. The vein was also growing thicker, being at this time over 3 feet in thickness. Up to this time we had only gone about 4 feet into the vein longitudinally.

At 8.45 a. m. of the 28th instant, Ensign Keeler received orders from you, brought by two kayaks from Godhavn, for the expedition to return to Godhavn as soon as possible, as you only awaited our arrival to depart from that place. The sloop had not arrived up to this time, and we had no means for transporting the coal which we had mined to Godhavn, consequently we were obliged to leave all that would not go into the launch on the beach. This we were very loth to do, but there was no help for it. After depositing our tents, implements, &c., into the launch, we found we had only room for about two tons of coal, which we brought with us. Our twelve men, six officers, and two Esquimaux, in addition to the other things, sunk the launch pretty deep. Our water-tanks, with the exception of two compartments holding about forty gallons of water, were converted into coal-bunkers, consequently we were obliged to use salt-water for our boilers, which necessitated frequent blowing to get rid of the saline matter left behind, after the steam had been generated from the water.

The expenditure of fuel to heat the double quantity of water used, which stood at a temperature of 42° F, was necessarily greater than it

would have been had we used fresh-water, which this boiler was built for the use of.

We made the run from the mines to the ship, a distance of ninety miles, in exactly fifteen hours, burning about one and a quarter tons of coal, during which time we kept up a regular pressure of steam of twenty pounds to the square inch, with the furnace door open a part of the time, and at no time allowed the saturation to go above $\frac{2}{32}$. We were unable to perform any careful experiments of the coal on the trip, but the following observations of its steaming qualities, made by me, I most respectfully submit to you.

The coal, when taken out of the mine, was chiefly in lumps, but it is so friable in its structure that about half of it broke into small particles while transporting it to the launch from the mine. It is comparatively easy to ignite, it burns freely, and forms very little clinker, and I found that the small particles burned nearly as well as the lumps. By weight, I should judge that it required about one-fourth more of this coal consumed in any given time to produce a mechanical effect equal to the best Welsh coal. It is bituminous in its nature, it produces very little smoke, of a brownish color, and requires very little labor in stoking; and the best results are obtained from a thick and level fire.

During our leisure time at the mines we prospected the immediate vicinity and found other veins, which indicated good coal and quantities of it. The coal is so easily mined that our force of twenty-one people could have removed and carried to the beach at least one hundred tons of coal within five days, with the tools which we used.

I am, sir, very respectfully, your obedient servant,

HENRY E. RHODES,
Second Assistant Engineer, U. S. N.

UNITED STATES STEAMER JUNIATA, (3d rate,)
Harbor of St. John's, Newfoundland, September 28, 1873.

SIR: I have the honor to inclose herewith, for the information of the Department, a copy of my orders, given to Commander James A. Greer, commanding the United States steamer Tigress, at Godhavn, Disco Island, Greenland, on August 25, 1873, as senior officer present, and which I judged are in conformity with the instructions of the honorable Secretary of the Navy, to myself.

I am, sir, very respectfully, your obedient servant,

D. L. BRAINE,
Commander U. S. N., Commanding
U. S. S. Juniata, (3d rate) *and Senior Officer present.*

HON. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES STEAMER JUNIATA,
Godhavn, Disco Island, Greenland, August 25, 1873.

SIR: I am pleased to acknowledge the receipt of your communication of this date, with the satisfactory information that, with the United States steamer Tigress, under your command, you successfully reached Littleton Island, Smith Sound, Arctic region, where you state that you obtained information that the crew of the Polaris passed last winter, and departed to the southward, some time in June, 1873. You also feel

convinced that the officers and crew of the Polaris have been picked up by some of the whalers that this year passed Cape York. You will, therefore, be pleased to carry out the instructions ot the honorable Secretary of the Navy by "renewing your search" on the west side of Davis Straits, until you find the officers and crew of the Polaris, or you gain satisfactory information of them, or you feel satisfied that you have done all in your power to carry out the orders of the Navy Department, from which I quote as follows: "Prosecute your search after parting company with him, (Commander Braine,) according to your own discretion under your orders." Wishing you success,

I am, very respectfully, your obedient servant,

D. L. BRAINE,
Commander, Commanding United States Steamer Juniata, and Senior Officer present.

Commander J. A. GREER,
Commanding United States Steamer Tigress.

P. S.—As you do not desire me to remain here any longer, with the view of assisting you in your search for the officers and crew of the United States steamer Polaris, I will sail from this port for St. John's, Newfoundland, about September 1 or 5, 1873, or as soon as the coaling party have retured from the coal-mine.

D. L. BRAINE,
Commander, United States Navy.

NAVY DEPARTMENT, *October* 9, 1873.

SIR: The Department has received your letter of the 28th ultimo, No. 50, and the copy therewith inclosed of the orders given by you to Commander J. A. Greer, commanding the United States steamer Tigress, in conformity with the instructions of the Department.

Very respectfully,

GEO. M. ROBESON,
Secretary of the Navy.

Commander D. L. BRAINE, U. S. N.,
Commanding United States Steamer Juniata.

UNITED STATES STEAMER JUNIATA, (3d rate,)
St. John's, Newfoundland, October 16, 1873.

SIR: I have the honor to report that the United States steamer Tigress, under the command of Commander James A. Greer, arrived in this port this afternoon, at 3 o'clock.

Agreeably with the telegraphic instructions I have received from the Navy Department, I have remained with this vessel under my command at this port until the arrival of the Tigress, and now, in accordance with the Department's orders, propose to sail with this vessel under my command for New York about the 20th instant, weather permitting.

I am, sir, very respectfully, your obedient servant,

D. L. BRAINE,
Commander U. S. N., Commanding Juniata, Senior Officer present.

Hon. GEO. M. ROBESON,
Secretary of the Navy, Washington, D. C.

[Telegram.]

NAVY DEPARTMENT, *October* 17, 1873.

Proceed to New York with Juniata.

GEO. M. ROBESON,
Secretary of Navy.

Commander BRAINE,
Care of United States Consul, St. John's, Newfoundland.

CONSULATE OF THE UNITED STATES OF AMERICA,
Dundee, October 22, 1873.

SIR: The Ravenscraig steamer, which picked up the fourteen men of the United States steamer Polaris off Cape York, arrived here on Saturday with the rough boat which the men had made during last winter, and by which they escaped from the ice. In the name of the United States, I claimed said boat as the property of the Navy Department, being in my opinion valuable as a relic of the north polar expedition. The captain denied my claim thereto, and stated (what I was not then aware of) that he was presented with the boat by Captain Buddington, Chester, and each and all of the men of the Polaris, and that it was now his property.

However, the owner of the Ravenscraig, Ninian Lockhart, esq., of Kirkcaldy, and the captain, very graciously (while repudiating the Navy Department's right to the boat) made a free gift of it to the Smithsonian Institution at Washington, and it will, I understand, be sent there along with the three men of the Polaris, (Bryan, Mauch, and Booth,) who arrived at this consulate to-day in the Erick whaler.

I telegraphed you this afternoon that these three men had safely arrived, and would be forwarded to New York by the Georgia steamship, of the State Line Steamship Company, sailing from Glasgow on Friday, 1st.

Let me repeat that this company deserves thanks for their attention, and repeated offers to convey the Polaris crew to New York. The moment they heard of the arrival of Bryan, Booth, and Mauch they telegraphed me that the Georgia was at their service, and I accepted their generous offer to convey these men (along with the boat referred to) in the saloon of their steamer to New York free of charge. They will proba bly reach New York on Wednesday week, 5th or 6th November. All of them are in good health, and I have supplied them with clothing and money, same as I did to the others.

Captain Allen and the surgeon, Dr. Souttar, of the Ravenscraig steamship, who picked up the fourteen men, have personally sustained heavy expenses in providing from their own wardrobes clothing to all the men. On investigation I find that Captain Allen gave clothing to Captain Buddington, Mr. Chester, and other men, to the value of ten pounds sterling, while the surgeon, Dr. Souttar, distributed a great number of articles of his own clothing to Dr. Bessels and others, which would exceed six pounds in value. You may have some idea of the amount of clothing so furnished, when I mention that, when picked up, the fourteen men of the Polaris were, many of them, pretty much clothed with bear-skins, seal-skins, and other like articles. I would, therefore, recommend that, in addition to the thanks of the Navy Department being conveyed to Captain Allen and his crew for the rescue of the

Polaris people, as well as Dr. Souttar, for his kindness, they should be re-imbursed for their personal outlays of clothing by the Government. I wished these two gentlemen (Captain Allen and Dr. Souttar) to state to me what claims they had, but they declined to do so, saying that they would rather prefer the Department itself to recognize their efforts in whatever way the Department thought proper. They mentioned to me, however, that by receiving the men, and having them on board, they missed the opportunity of catching whales, (by which their wages are regulated,) and only returned to Dundee with one fish.

Mr. Lockhart, the owner of the Ravenscraig, has, in answer to my request to be furnished with his claim for the board of the fourteen seamen of the Polaris, from 23d June last, (when they were picked up,) just waited upon me. He says that he cannot properly estimate what remuneration he is entitled to therefor, as he gave the men the free use of everything on board, which they availed themselves of.

Like Captain Allen and Surgeon Souttar, he prefers, he says, to leave his remuneration entirely in the hands of the Navy Department, feeling satisfied that the Government of the United States will not fail to recompense him for the loss he has sustained in his vessel returning home with only one fish, caused, he alleges, by receiving the Polaris's men, and having them on board, and providing for their wants, and getting them sent to Dundee.

It is not my duty to offer any suggestions to the Department as to the course to be pursued; but, as Her Britannic Majesty's government and the British press and people are anxiously watching what remuneration or recognition will be made by the United States Navy to the owners, captain, surgeon, and crew of the Ravenscraig, for their various kindnesses to the Polaris crew, and for rescuing them, I am sure that Congress, on the recommendation of your Department, will not fail to generously consider their claims, and award them ample recompense for their labors and outlays.

I have the honor to remain, your obedient servant,

WILLIAM REID,
United States Vice-Consul.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

No. 72.] UNITED STATES STEAMER JUNIATA, (3d rate,)
Navy-Yard, Brooklyn, N. Y., November 10, 1873.

SIR: Referring to paragraph No. 1093, United States Naval Regulations, authorized by act of Congress May 17, 1864, I have the honor to again call the attention of the Department to the cases of the following-named men, reported by me in my letter No. 36 to the Department, under date of August 16, 1873, as deserving of medals of honor, for extraordinary service rendered as volunteers, in forming the crew of the steam-launch Little Juniata, in her cruise from Upernavik to Cape York, Greenland, and return, and whose names I think the Department may have overlooked.

I would again ask that, if consonant with the views of the honorable Secretary, the medals of honor and the accompanying gratuity, designated by the act of Congress above referred to "under the head of

extraordinary heroism in the line of their profession," may be allowed these men, viz: Richard Street, boatswain's mate; Frank Hamilton, machinist; William King, seaman, extra; and Martin T. Maher, ordinary seaman.

Very respectfully, your obedient servant,

D. L. BRAINE,
Commander U. S. N., Commanding U. S. Steamer Juniata.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES STEAMER JUNIATA, (3d rate,)
Off Battery, New York, November 1, 1873.

SIR: I have the honor to make the following report of the cruise of the United States steamer Juniata, under my command, whilst prosecuting the search in the Arctic regions for the United States steamer Polaris, her officers and crew; all under your orders dated June 19, 1873.

The Juniata sailed June 24, from the port of New York, deeply laden with a deck-load of coal and a reduced complement of men. We arrived at St. John's, Newfoundland, June 30, and, after sheathing her bows to meet the ice, and coaling ship to her utmost capacity with a heavy deck-load of coal for the United States steamer Tigress, July 9, 1873, we sailed for the Arctic regions. Amid dense fogs we prosecuted the voyage toward Greenland, having several very narrow escapes from collisions with icebergs.

July 14 we arrived off Fiskernaes, where we met large quantities of ice, and had to pick our way very carefully through it. After several hours' delay off this port, and making the usual signals and failing to obtain a pilot, we stood to the northward along the coast and had several very narrow escapes (owing to fogs) from rocks and icebergs which lined the coast.

July 17 arrived at the port of Sukkertoppen, Greenland, after considerable difficulty. Being unable to procure dogs at this place, in accordance with your instructions, after exchanging official visits with the Danish Governor Larsen, I sailed at 4 a. m. on the 18th for Holsteinborg, at which place I arrived the same day at midnight.

Through the courtesy of Governor Frederick Larsen, with whom I exchanged official civilities, I procured at Holsteinborg eighteen Esquimaux dogs and one hundred and fifty seal-skins for the use of the officers and men of the Tigress.

On July 21 I left Holsteinborg for Godhavn, island of Disco. While at the last-named port I landed about seventy tons of Cardiff coal in bags for the Tigress, also the dogs purchased at Holsteinborg, and in addition twelve others purchased for the same object at this last port. At this part of the Greenland coast, I may state that our cruise became of the most interesting character, having passed a belt of ice off Fiskernaes, also many bergs which had been swept by the current setting around from the east coast of Greenland, and thence north up the west coast.

Our necessitated stay at Godhavn of one week, enabled the officers to prosecute most interesting explorations in regard to Arctic mosses, flowers, and ferns on the mountains hereabout; also to observe an immense number of icebergs in Disco Bay, which had broken off from

the glaciers back of Jacobshaven Fiord, thence passing out of the bay to the westward of the island of Disco, and drifting to the northward with the current, there being over a thousand in sight at one time, and others moving up through Waigatt Strait to the northward of the island of Disco, in connection with those already mentioned, came from Tussukats glaciers to the northward of Prindsen Island.

In conversation with the assistant governor, A. F. Muldriep, who, in the absence of the inspector, S. T. Krarup Smith, was in official charge of Godhavn, and the esteemed lady, the wife of Inspector Smith, of North Greenland, I first learned of the deposits of coal on Disco Island, at Nomsook Peninsula, on Amenak Fjord; but, as my object was to reach Upernavik with all dispatch, I could not at the time make an examination of the coal veins.

July 29, I sailed for Upernavik, and on the passage to that point, where we arrived July 31, we encountered many immense icebergs, whose altitudes were often 200 feet and upward; we had several narrow escapes from them, and on the morning of July 31, whilst pursuing our voyage, owing to the large variation of the compass 85″ westerly and upward and the local deviation together with the inset of the tides in the fiords, the ship was placed in a most perilous situation, we having run into the midst of a group of very high mountainous rocks. The rocks first reported close aboard we barely sheered clear of, only to find others on both bows and beam, and also in the direction in which we had come. After drifting about for half an hour and using our steam we fortunately found an anchorage in 85 fathoms of water, the general depth around us having been 200 fathoms and more. Here we lay close to the rocks, 2,000 feet in height, for several hours until the fog lifted, when we were fortunate again to get to sea; and that afternoon, after winding our way through an innumerable number of bergs, we anchored in the port of Upernavik.

Governor Rudolph and myself exchanged courtesies immediately, and he informed me that a ship of even half the size of the Juniata had never been there, certainly during the period of his official stay, extending over thirty-five years. He warned me of the great danger of remaining there, and recommended me to immediately place the ship in what is called the Danish Harbor, where the Royal Greenland Trading Company's vessels are loaded. I followed his advice and anchored in this harbor, which can more properly be designated as a pocket, and where a vessel is protected from the prevailing gales of that period on that coast, which blow from southwest, true. Here we moored head and stern with our heaviest cables. From this point I dispatched our largest steam-launch, the little Juniata, under command of Lieut. George W. DeLong, United States Navy, who had associated with him (they all being volunteers) the following-named officers and men: Lieut. Charles W. Chipp, Ensign Sidney H. May, Mr. Henry W. Dodge, ice-pilot; Richard Street, boatswain's mate; Frank Hamilton, machinist; William King, seaman extra; and Martin T. Maher, ordinary seaman.

With the Little Juniata most carefully equipped, with sixty days' provisions and fifteen days' coal, August the 2d, she sailed for Cape York, to prosecute the search for the Polaris, her officers and crew. After performing what Governor Rudolph considered one of the most extraordinary voyages on record, along the fast ice, through the innumerable icebergs, pack and hummock ice of Melville Bay, to Cape York, latitude 75° 56′ north, longitude 68° 18′ west, (for full particulars of her cruise, I have the honor to refer you to Lieutenant DeLong's report, a copy of which I forwarded to the Department,) he returned to

the ship at Upernavik, August 12, having met the Tigress off Tessuisak, her commanding officer, Lieutenant DeLong, having imparted to Commander Greer what I considered important information in regard to the open water at that time between Cape York and Tessuisak, no doubt thereby facilitating the voyage of the Tigress to the northward and westward on her search.

Having had several falls of snow between the 2d and 12th of August, and being warned by Governor Rudolph of the peril of a stay here of a ship of the size of the Juniata, ice having also formed in the ponds 200 feet above the level of the sea, and ever since my arrival finding it necessary to stretch hawsers across the harbor to keep out the ice, and having to use our guns with solid shot to break up the small bergs drifting down against the ship, and having delivered to the Tigress the seal-skin clothing, coaled, and dispatched her from this point, the necessity was apparent that I should proceed to my next point of rendezvous with the United States steamer Tigress, viz, Godhavn, island of Disco. Thence I sailed August 13, and having very clear weather arrived at Godhavn August 15, where I expected to await until the last of the season, October 15, 1873, the arrival of the Tigress, or news from her, and from which place I dispatched a kyack seven hundred and fifty miles down the coast to Iriktout, latitude 61° 10′ north, longitude 47° 10′ west, with a request to the authorities there that they would reserve all the coal they could for the use of the Tigress, and at her arrival in which place afterward she obtained 190 tons.

With the expected leisure time before me at Godhavn, I immediately availed myself of the means at my command to prosecute a search for coal, expecting, should the Tigress be successful, that she, and perhaps the Polaris, might need it for their return home. The inspector of North Greenland, S. T. Krarup Smith, being absent at Egedismindie, a distance of seventy miles from this point, I dispatched the whale-boat, in charge of Ensign John D. Keeler, my clerk, G. J. Marbury, and gunner, M. K. Henderson, with a crew of six men, to that place, asking him for the use of any small vessels he might have at his disposal, to bring coal from the mine to the ship at Godhavn. The voyage was successfully made in three days through a gale of wind, and the duty so well performed that I assigned Ensign Keeler to the command of the steam-launch Little Juniata, having associated with him Second Assistant Engineer Henry E. Rhoades, also the officers who had been with the whale-boat, to the coal-mine on the northeast part of Disco Island.

They prosecuted the search successfully, and found several veins of coal running through the mountain longitudinally, the position of the mine being latitude 60° 45′ north, longitude 52° 20′ west.

The mines are a short distance back from the beach, and about 100 feet above the level of the sea. Enclosed please find photograph of a sketch of the same.

On top of these veins of coal were three strata, viz, one stratum of sand, another of black silicate clay, and one of sand, this latter immediately on top of the coal. The coal is easily obtained; the tools used were pickaxes, chisel-bars, and shovels, the mining being done by nine of our men ; the coal carried in bags to the beach. As the mining advanced into the mine, the coal assumed a brighter and blacker hue, indicating the presence of bitumen, and some lumps were sprinkled with small particles of resin, the veins growing thicker as the mining proceeded. The coal proved frail in its structure, not bearing much handling, and was obtained in lumps. It was experimented with for fifteen hours' steaming in the Little Juniata, using salt water. It ignites easily,

burns freely, and forms very little clinkers. The fine coal burns nearly as well as the lump. A regular pressure of steam was kept up 20 pounds to the square inch, with the furnace doors open part of the time, and at no time was the saturation above $\frac{2}{3}\frac{}{2}$. By weight I judge it requires about one-fourth more of this coal to be consumed in any given time to produce a mechanical effort equal to the best Welsh coal. This coal is bituminous in its nature. It produces very little smoke, of a brownish color, and requires but little labor in stoking. The best results as obtained are from a thick and level fire.

While in this locality, several veins were found which indicated good coal and large quantities of it; so easily was the coal mined that our men, nine in number, would have removed and carried to the beach at least 100 tons in eight days with the tools which we used.

I inclose herewith a chart of this and the immediate coal-regions on the west coast of Greenland.

I should here say, in this connection, that the anchorage and holding-ground off the coal-mines worked by us is good, with a depth of from 10 to 20 fathoms, and I deem it perfectly feasible to mine the coals at this point successfully and in large quantities of quality as stated above.

The unexpected arrival of the Tigress at Godhavn, August 25, where I again coaled her, and from whence she sailed the same day to prosecute her search to the westward and northward, caused me to recall the coaling party, though only a small quantity of this coal was brought from the mines, 35 tons of coal being left on the beach for want of means of transportation. I have sixteen bags of this coal, about 150 pounds to the bag, which will be sent to the Washington navy-yard, under the instructions of Engineer-in-chief W. W. W. Wood, Chief of the Bureau of Steam-Engineering, to be tested.

August 31, I sailed for St. John's, Newfoundland, where I arrived September 10, having performed the voyage of over twelve hundred miles almost entirely under sail alone, keeping a careful lookout for whalers in Davis Strait on the way.

On my arrival at St. John's I telegraphed information to the Department of the Tigress finding deserted camp of the Polaris officers and crew at Littleton Island, and that they had started to the southward early in June, 1873, in two whale-boats made of ship.

Here I received telegraphic orders to continue the search for the officers and crew of the Polaris, and after coaling the ship, filling the bunkers and taking a heavy deck-load of coal, I sailed to the northward September 18, in obedience to orders. At midnight of that day, when sixty-five miles to the northward of St. John's, I was overhauled by the English steamer Cabot, the United States consul to St. John's, Mr. T. N. Molloy, on board, who gave me the gratifying information of the safety of the officers and crew of the Polaris, who had arrived that day at Dundee, Scotland, in the English whale steamer Arctic. I immediately returned to St. John's, when I received telegraphic instructions to "await here the arrival of the Tigress."

October 16, 1873, the Tigress arrived at St. John's, and October 19, 1873, I sailed, in obedience to telegraphic orders, from St. John's for New York, at which port I arrived October 25, 1873.

I beg leave to inclose also a tracing of a chart showing the tracks of the United States steamers Juniata, Tigress, and steam-launch Little Juniata, in the prosecution of the search in the Arctic regions for the Polaris, her officers and crew, during the months of July, August and September, 1873.

I send to the Department a book containing specimens of flowers,

ferns, mosses, and plants gathered in Greenland, with the latitude specified, also the elevation above the level of the sea.

In conclusion, it is with great pleasure I refer to the spirit which prevailed among the officers and crew of the Juniata, the zeal, energy, alacrity, and willingness of all to face every danger which we encountered, the spirit of emulation to prosecute the search at all hazards with the limited means at our command, the continuous volunteering for all kind of duty, enables me to speak of all in the highest terms of praise, and permits me to commend them to you as worthy of the Department's consideration when they are needed for duty calling for a high order of professional skill and confidence.

I am, sir, very respectfully, your obedient servant,

D. L. BRAINE,
Commander U S. N., commanding U. S. Steamer Juniata.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

NAVY DEPARTMENT, *October* 30, 1873.

SIR: The Department has this day authorized Vice-Admiral Rowan to grant two weeks' leave to the officers and one week's leave to the crew of your vessel, in such parties and at such times as you may suggest.

This is granted in consideration of the arduous services in the Arctic regions, from which you have just returned.

Respectfully,

GEO. M. ROBESON,
Secretary of the Navy.

Commander D. L. BRAINE, *U. S. N.*,
Commanding U. S, Steamer Juniata, New York.

UNITED STATES STEAMER JUNIATA, (3d rate,)
Navy-Yard, New York, November 1, 1873.

SIR: I have the honor to acknowledge the receipt of the Department's communication of the 30th ultimo, and with pleasure thank the honorable Secretary of the Navy for his appreciation, as expressed therein, of the services of the officers and crew of the ship under my command, during her voyage in the Arctic region in search of the Polaris, her officers and crew, during the months of July, August and September, 1873.

I have the honor to be, sir, very respectfully, your obedient servant,

D. L. BRAINE,
Commander U. S. N., commanding U. S. Steamer Juniata.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

PROCEEDINGS OF THE TIGRESS IN THE SEARCH FOR THE POLARIS.

NAVY DEPARTMENT,
Washington, July 10, 1873.

SIR: The Tigress has been purchased and commissioned by the Navy Department, and prepared in all respects to go the rescue of the Polaris, her records, officers and crew. She was built of extra strength for voyages amongst the ice, and has been materially strengthened since her purchase by the Department, in order to render her better adapted for the service she is now to undertake. You have been appointed to her command, and you will, as such commander, carefully carry out the following instructions:

When entirely ready for sea, you will proceed directly to St. John's, Newfoundland. At that place you will fill up with coal adapted for her use, taking as much in her bunkers and on deck as you can safely carry. Thence you will make the best of your way to Godhavn, on the island of Disco, on the west coast of Greenland, taking for that purpose the most open navigable route and keeping a lookout, as you proceed, for the Polaris and for the Juniata. If you fall in with the Juniata, at this or any other time, you will communicate with her, show your instructions to Commander Braine, and deliver to him the inclosed orders. Should you meet the Polaris alone, you will render every assistance necessary and afford her convoy direct to New York. Otherwise, on arriving at Godhavn, you will ascertain from the Danish authorities whether any information has been received from the Polaris or her crew; and you will probably there find letters from the Juniata, giving you information as to her movements, and such news and information of the Polaris expedition as she may have obtained.

After procuring such information, and supplying, as far as possible, all your wants at Godhavn, you will leave with the Danish authorities a report to the Department of your proceedings thus far, (requesting their transmission to the United States by the first opportunity,) and you will then proceed northward to Northumberland Island, keeping a careful lookout for any signs of those of whom you are in search, going by the way of Upernavik and Tessuisak, unless by falling in with the Polaris, or with some of her officers and crew, before reaching these points, or by reason of the receipt of some positive and reliable information concerning them and their situation, your further progress is rendered unnecessary.

If, however, you do not fall in with the Polaris or her people on the way, or no such positive and certainly reliable information reaches you, you are to push on, by every means in your power, for the position in which the ship was last reported by those of her crew who were rescued by the Tigress, namely, under Northumberland Island, in latitude 77° 35′ north, and continue your search until you find them or obtain satisfactory information concerning them and the ship, or until you are compelled to abandon it by want of means, subsistence for yourself and crew, or by other reasons entirely beyond your control. If the Polaris, wherever found, can be brought home, she is not to be abandoned, but you will take charge of her, and, putting proper officers and crew on board, bring her to New York. If she cannot be saved by any means in your power, then her officers and men, her records, scientific and nautical, and everything of value that can be removed, will be transferred to the Tigress and brought by her to the United States.

The Department desires that you will endeavor to rescue and bring home—

First. The officers and crew of the Polaris;

Secondly. The records, scientific and nautical; and,

Thirdly. The ship.

Each of these to be saved in the order named, at the sacrifice, if necessary, of the others later in order of importance.

It is the hope of the Department that in prosecuting this search you will not be detained by the ice or by any other cause so long as to prevent your return during the autumn of the present year. If, however, circumstances compel you to winter in a northern latitude, you will take every precaution to secure the Tigress in a safe anchorage, promoting in every way the health and comfort of those under your command during the dangerous and trying months which must ensue, keeping up your watchfulness during the winter, and when the season opens again renewing your search and prosecuting it until prudence constrains you to return homeward, by no means remaining in the Arctic latitude after the navigation closes next year unless, on your judgment as an educated and responsible naval commander to whom is intrusted a Government ship with its officers and crew, you should think that the objects of your expedition and all the circumstances of the case fully justify you in such course.

Mr. Tyson, late of the Polaris, goes with you as ice-master and pilot. His knowledge of the navigation of Davis Strait, the result of much experience in those waters, and his recent service on the Polaris further north, will render his presence on board the ship of great value.

A competent assistant is also supplied to meet with the possibility of accident to or disability of Mr. Tyson. Six of the seamen of the Polaris, rescued with Mr. Tyson, will also form part of your crew, and may be considered as excellent hands in the service in which you are engaged.

The Esquimaux Hans and his family will be received on board of the Tigress, comfortably cared for, and landed at Godhavn, Upernavik, or such other port as he may desire, which may not interfere with the objects of your expedition; or, if he is willing, and you desire it, he may be retained to assist in your search at the same pay he is now receiving. If discharged, Hans is to be paid off in full. "Esquimaux Joe" will also accompany you, to be employed as you may find his services available, and to return with you to the United States. You will find him most trustworthy, and valuable as a hunter and sledge-driver, and can rely upon his fidelity and experience.

While you are in company with the Juniata you will of course be under the orders of the senior officer present, subject, however, to the orders of the Department, and when separated from that ship you will carry out your instructions to the best of your own ability and discretion, having due regard to the object for which the Tigress has been commissioned, fitted, and placed under your command—that is, to penetrate through the ice, if necessary, to Northumberland Island, to rescue the Polaris, her records, and people, or to ascertain their fate, and to return either this year or next, as may be possible, to the United States.

If it should be your good fortune to rescue the Polaris, you are authorized to put your own officers on board, and to convoy her to New York; but you will touch at such places of rendezvous on your return southward as may have been appointed for you to meet the Juniata; and, failing to meet her at any of them, you will proceed to Godhavn, where the Juniata is finally, under the orders of the Department, to await your arrival as long as the navigation remains open this season; and, in this

event, you will be subject generally for your further instructions to the senior officer present, who will, however, allow you to bring in the ship you have rescued, and will not interfere with your orders for that purpose unless the interests of the service shall specially require it.

If, however, on your arrival at Godhavn, on your return homeward, either this year or next, you do not find there a senior officer, you will discharge all the obligations you may have incurred at that place, embark such of the stores and coal as remain there, and, if you have the Polaris in company with you, leave her there should prudence demand it, and if not, convoy her to New York, making from this port a report of your return, and of the particulars of your voyage, to the Department.

Special orders have been given to Commander Braine, commanding the Juniata, directing him to facilitate by every means in his power your advance northward, as the expedition specially fitted and intended to encounter the ice; and advising him that it is upon your specially fitted ship and selected crew that the Department relies to meet and overcome the dangers and difficulties of an Arctic voyage, to which the Juniata is not to be voluntarily exposed; and further directing him to permit you to prosecute your search after parting company with him according to your own discretion, under your orders, and to convoy the Polaris home, should you rescue her; and directing him not to interfere with the *personnel* of your ship, except at your request or under the pressure of imperative professional necessity.

Full reports of the examination of the portion of the crew of the Polaris rescued from the ice will be furnished you, with all the information resulting therefrom.

Relying upon your zeal, discretion, and professional knowledge and spirit, the Department bids you God-speed, and commends you and your comrades, and the result of your difficult and dangerous enterprise, to His overruling and all-wise providence.

Very respectfully, your obedient servant,

GEO. M. ROBESON,
Secretary of the Navy.

UNITED STATES STEAMER TIGRESS,
Navy-Yard, New York, July 14, 1873.

SIR: I have the honor to transmit a list of "passengers" of this vessel.

Very respectfully, your obedient servant,

JAS. A. GREER,
Commander, Commanding.

Hon. G. M. ROBESON,
Secretary of the Navy, Washington, D. C.

FORM No. 10.—PASSENGERS.

List of officers or others about to sail, as passengers, in the United States steamer Tigress. Dated at New York, the 14th day of July, 1873.

Names.	Remarks.
Hans Christian, wife, and 4 children.	Bound to Greenland.

Very respectfully,

JAS. A. GREER,
Commander, Commanding.

UNITED STATES STEAMER TIGRESS,
Off Pollock Rip, July 16, 1873—7 a. m.

SIR: I have the honor to inform you that this vessel sailed from the navy-yard, New York, at 5.10 p. m., July 14. The weather has been pleasant and the sea smooth, giving us no chance to test the qualities of the vessel. All on board are well. I send this by the sound pilot. Three of the seamen of the Polaris, viz, G. W. Lindguist, J. Kruger, W. Nindermann, are on board. The others did not report on board.

Mr. Stickney, I presume, has informed you of his action as to paying the men. I filled up our complement from the Vermont. We have on board 11 officers, 32 men, and 7 Esquimaux.

Very respectfully, your obedient servant,

JAS. A. GREER,
Commanding.

Hon. G. M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES STEAMER TIGRESS,
St. John's, Newfoundland, July 23, 1873.

SIR: I have the honor to inform you that we arrived here this morning, after a passage of eight and a half days from New York. We had one moderate gale, of a few hours' duration, in which the vessel showed herself to be a good sea-boat. As a steamer she may be classed as a "five-knot" one.

The engineer proposes to make a change in the furnaces, which may increase the speed. I expect to sail for Disco in two days. We saw our first icebergs off Cape Race. All hands are well.

I send this by the mail-steamer, which leaves to-day.

Very respectfully, your obedient servant,

JAS. A. GREER,
Commander, Commanding.

Hon. G. M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES STEAMER TIGRESS,
St. John's, Newfoundland, July 26, 1873.

SIR: I have the honor to inform you that, having filled up with coal and other stores, we sail to-day for Disco.

I have exchanged with the governor the courtesies usual at this place. All are well.

Very respectfully, your obedient servant,

JAS. A. GREER,
Commander, Commanding.

Hon. G. M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES STEAMER TIGRESS,
Godhavn, Disco Island, August 8, 1873.

SIR: I have the honor to inform you that we arrived at this place on the 6th instant, ten and a quarter days from St. John's, Newfoundland, after a somewhat boisterous passage, during which the vessel showed her good qualities as a sea-boat.

By some changes made in the furnaces we have been able to obtain a speed which will authorize me to class the Tigress as a 6-knot steamer under favorable circumstances.

The Juniata sailed for Upernavik July 29, having taken all the anthracite coal which was here, and leaving for this vessel about sixty-five tons of Cardiff coal, which will not fill up by twenty-five tons.

As fuel is essential to this vessel for carrying out the wishes of the Department, I intend, when I meet the Juniata, to request Commander Braine to supply us with anthracite coal sufficient to fill our bunkers.

Owing to the short-handedness of the crew, and the impossibility of obtaining a sufficient force from Godhavn, the handling of the coal here has caused a detention of a day.

I beg to call your attention to the fact that there is now no coal on the Greenland coast. Should we be so fortunate as to fall in with the Polaris this season, and be able to reach a Danish settlement, she will be, (no matter how seaworthy,) in all probability obliged to remain there until supplied with coal next year. Should this vessel be obliged to spend a winter in the ice, the need of a supply of coal, to be in readiness for us on our return to the southward, will be apparent.

Mr. Smith, the inspector of North Greenland, is absent, but I have been courteously received by Mr. Müldrüp, the governor of Disco Island.

At St. John's two men deserted, viz, George Gray, (quartermaster,) and William Bayes, (carpenter's mate.) I shipped at that place one seaman, one man since rated carpenter's mate, and one machinist to take the place of a man who is physically disabled. I propose, in due form, and with Commander Braine's consent, to send him and one of the seamen who has proved to be worthless on board of the Juniata.

All hands are well, with the exception mentioned.

We sail for Upernavik this afternoon. I will have this letter sent (leaving a duplicate here) by a vessel which sails for Denmark soon.

* * * * * * *

Very respectfully, your obedient servant,

JAS. A. GREER,
Commander, Commanding.

Hon. G. M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES STEAMER TIGRESS,
Off Upernavik, Greenland, August 11, 1873.

SIR: I have the honor to report that this vessel arrived here yesterday, thirty-nine hours from Godhavn, island of Disco.

The Juniata is here. Commander Braine has done everything in his power to facilitate our departure, and I expect to sail this afternoon for Tessiusak and the northward.

Thomas Harrington (captain of top) broke his leg at Godhavn. He and two other men have been transferred to the Juniata. Commander Braine has furnished men to take their places.

I cannot find at this place the copy of the agreement made with Hans Christian. I have paid him off in accordance with the terms mentioned by Captain Hall in one of his letters to the Department, viz, "fifty Danish dollars per month," for twenty-three and a half months, equal to $640.09 in American gold.

I have received from the Juniata thirty-seven and a half tons of anthracite coal.

There are on board of this vessel 45 persons, viz, 12 officers, 32 men, (including the apothecary,) and "Esquimaux Joe."

All hands are well.

Very respectfully, your obedient servant,

JAS. A. GREER,
Commander, Commanding.

Hon. G. M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES STEAMER TIGRESS,
Off Godhavn, Island of Disco, Greenland, August 25, 1873.

SIR: I have the honor to report that this vessel sailed from Upernavik, North Greenland, on August 11, 1873, at 5.10 p. m., a Danish pilot being on board.

At 11.45 p. m. arrived at Tessiusak. On approaching the anchorage, and while forging ahead slowly, the engine caught on center. Let go the anchor, but failing to bring the vessel up, she ran lightly upon a smooth rock. Backed off in a few minutes; no damage done. Governor Janses came on board, having no information. I accepted his services as pilot to clear us of the islands.

August 12, at 1.15 a. m., stopped and communicated with the Juniata's steam-launch. Obtained no information about Polaris.

At 1.45 a. m. discharged pilots, parted company with steam-launch, and stood to the northward.

August 13, at 10 a. m., passed Cape York. Heavy pack-ice prevented our getting very close, yet we were near enough to clearly observe any signals that might have been made. A bright lookout was kept at all times.

From Cape York skirted the shore as closely as safe navigation would permit. This was also done upon our return. At 9 p. m. examined North Star Bay.

August 14, examined Netihk Harbor; skirted Northumberland Island. Being convinced that this was not the place where the separation of the party on "ice-floe" and Polaris occurred, continued on for Capes Parry and Alexander. Examined Hartstene Bay. At 9 p. m., having passed Littleton and McGary Islands, feeling quite sure that this was the place we were seeking, stood well in and lowered a boat.

Discovered (one month and four hours after leaving New York) a camp, which, upon examination, proved to be the one which was occupied by crew of Polaris last winter. It is now occupied by Esquimaux, who seem to be quite intelligent. From them I learned that they came from Pond's Bay, on a hunting expedition, and found the Polaris secured to the rocks, the crew living on shore. That they had built two boats out of material taken from the vessel, fitted them with oars and sails,

and about one moon or so ago, or when the ducks began to hatch, (which I think was about the middle of June,) they all being well, had gone to the southward. Also, that Captain Buddington, the head man, before he departed told him (the chief Esquimaux) that he could have the vessel.

A gale of wind came on some time after the departure of the crew; the vessel broke adrift, (I saw the broken hawsers,) and, drifting about a mile and a half toward the passage between Littleton Island and the main land, sank. The native said he saw her go down, and regretted her loss very much. He went with Lieut. Commander H. C. White to the place, but two small (comparatively speaking) ice-bergs, with a heavy floe about them, covered it, having doubtless "grounded" upon the wreck, which caused their detention at the spot, as there were 7 to 11 fathoms of water around it.

At the camp a comfortable wooden house had been constructed, having in it bunks, mattresses, furniture, galley, &c.

The natives had two tents, made out of canvas, evidently from the Polaris. A rough carpenter's bench, with many shavings about it, was in the camp. Provisions, instruments, books, and stores of various kinds were scattered around the small camp in every direction, and all in quite bad condition.

I caused to be brought on board all the manuscript matter, including a mutilated log-book, all the books which were not torn to pieces, some fire-arms and broken instruments, the ship's bell, and some medical stores. The provisions and other stores were of no earthly value, and I did not bring them off. A cairn or place of concealment for papers and records was sought for, but none could be found.

The weather was quite threatening, thick, squally, and snowing at times, with an ice-pack to the northward, extending as far as the eye could reach across Smith Sound.

At 2.15 a. m., August 15, I stood to the southward, keeping a lookout for the people. The position of what I call "Camp Polaris" is, as taken from the chart, latitude 78° 23′ north, longitude 73° 46′ west.

At noon, August 16, passed Cape York near enough to have seen signals. Found much ice about it, and stood for Melville Bay.

August 19, at 2.30 p. m., communicated with Governor Janses, at Tessiusak; obtained no news. At 9.30 p. m., anchored at Upernavik; nothing had been heard there of the crew of the Polaris. Remained at Upernavik, overhauling and repairing machinery, until August 23, 2 p. m., when we sailed for this place, arriving here August 25, 2 a. m., being almost positively assured in my own mind that the crew of the Polaris have been taken on board a whaler. The following-named are known to have passed to the northward this year, viz: Asuk, or Asik, of Dundee; Arctic, believed to be of Dundee; and seven others whose names I have not been able to learn, and they all (those that have been spoken) expected to sight Cape York.

I have concluded, in accordance with my instructions from the Department "to make a thorough search for the crew," to go to the west side of Davis Strait, skirting the pack until I find a chance to get through, then to work to the northward in search of the whalers, who, on their return voyage, follow the western shore. The search will be continued as long as prudence will justify, taking into consideration the condition of the ice and our supply of fuel, (which will be used economically.) I will then proceed to St. John's, Newfoundland. We have now on board 155 tons of coal.

I expect to sail to-day. All hands are well. Appended is a chart showing "Camp Polaris."

Very respectfully, your obedient servant,

JAS. A. GREER,
Commander, Commanding.

Hon. G. M. ROBESON,
Secretary of the Navy, Washington, D. C.

P. S.—Since writing the above, I have received from Commander Braine, of the Juniata, 13 tons of coal.

JAS. A. GREER.

Forwarded.

D. L. BRAINE,
Commander U. S. N., Commanding Juniata,
and Senior Officer Present.

UNITED STATES STEAMER TIGRESS,
Niantihk, Cumberland Sound, September 15, 1873.

SIR: I have the honor to inform you that this vessel sailed from Godhavn, Disco, on August 25. We stood for the west side of Davis Strait, and on the 26th, in latitude 67° 30′ north, longitude 60° 15′ west, fell in with the pack, as it extended well to the north and east. I skirted it to the south and west, going into every lead that indicated a passage. When in the neighborhood of Cape Searle, found that the ice was packed tight to the shore; worked out, and tried to get into Exeter Bay, with same result. Having been informed that the Scotch whalers at times ran into Cumberland Sound at the close of their season, and being short of coal, I determined to come to this place.

South of Cape Walsingham we had a heavy gale, which lasted three days, during which it was necessary to lie to under steam and sail.

We arrived here on September 4, and have, when the weather would permit, been engaged in getting on board stone ballast.

* * * * * * *

I expect to sail to-morrow for Tonhik, Greenland. After obtaining at that place, all the coal possible, I will sail for the narrow part of Davis Strait, and cruise for the purpose of intercepting some one of the whaling fleet.

The Tigress may be expected at St. John's, Newfoundland, in the latter part of October. All are well.

Very respectfully, your obedient servant,

JAS. A. GREER,
Commander, Commanding.

Hon. G. M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES STEAMER TIGRESS,
Toigtut Sound, Greenland, October 4, 1873.

SIR: I have the honor to inform you that this vessel sailed from Niantihk, Cumberland Sound, on September 16. After a boisterous passage and one very heavy gale, we reached this place on September 27, having stopped a day at Sanernt on account of a head gale.

The authorities here have been very courteous, and have done everything in their power to assist us.

From Mr. S. Fritz, the very obliging agent of the Kryolith Company, I have obtained 190 tons of coal. In accordance with his desire, (as he

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does not know what the company will charge,) I have given him receipts for the coal, which he will forward to the New York agent of the company, Mr. C. Ed. Habicht, 68 Broadway, who will present the bill to the Department.

We, as usual, have much work to do to the machinery. For several days before our arrival here we were obliged to work high pressure, which reduced our speed very much.

We have heard nothing of the crew of the Polaris. I expect to sail to-day for the northward, keeping a lookout for the whalers. I shall cruise as long as the season will justify, and then proceed to St. John's, Newfoundland.

On the day that we left Niantihk, I supplied the American schooner Helen F., of New London, Conn., (which was in need of them,) with a few stores at Government prices. All hands are well.

Very respectfully, your obedient servant,

JAS. A. GREER,
Commander, Commanding.

Hon. G. M. ROBESON,
Secretary of the Navy, Washington, D. C.

[Telegram.]

ST. JOHN'S, NEWFOUNDLAND, *October* 17, 1873.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C., United States:

Tigress arrived. All well. Sail for New York in a week. Met no whalers. Had a bad time in Davis Strait.

JAS. A. GREER,
Commander, Commanding.

UNITED STATES STEAMER TIGRESS,
Navy-Yard, New York, November 10, 1873.

SIR: I have the honor to inclose a list of passengers brought to the United States in this vessel.

Very respectfully, your obedient servant,

JAS. A. GREER,
Commander, Commanding.

Hon. GEO. M. ROBESON,
Secretary of the Navy, Washington, D. C.

FORM No. 10.—PASSENGERS.

List of officers or others about to sail as passengers in the United dated at St. John's, New Foundland, the 30th day of October, 1873.

Name.	Remarks.
Louis Moisette ..	A distressed American citizen, sent home by United States consul at St. John's. He served as a ward-room boy, and was of no expense to the Government.

JAS. A. GREER,
Commander, Commanding.

P. S.—The above-mentioned man came to New York in the Tigress.

JAS. A. GREER

No. 15.

PROTECTION TO AMERICAN CITIZENS AND PROPERTY AT PANAMA.

SOUTH PACIFIC STATION,
UNITED STATES FLAG-SHIP PENSACOLA,
Bay of Panama, U. S. C., May 13, 1873.

SIR: I have the honor to inform the Department that as soon as I had dropped anchor at this place, on the 7th instant, Commander Belknap, of the Tuscarora, called upon me and reported that the parties contending for the possession of the government of the state of Panama had commenced hostilities, and at that time fighting was going on between them. That he had been called upon by our consul to furnish protection to the citizens of the United States and the railroad depot, and had promised to send a force on shore at such time as the consul should designate, and a certain signal would be made on shore in the event of the force being needed.

I approved of Commander Belknap's course, and gave orders to Captain Upshur, of this vessel, to have in readiness, to send on shore at a moment's warning, a force of one hundred men and two pieces of artillery.

At about 5 p. m. the signal as agreed upon was made, when the force above mentioned was promptly sent to the railroad depot for its protection and the immense quantity of property therein stored. The officer in command of this force, Lieut. T. B. M. Mason, United States Navy, was ordered to confine himself alone to the protection of the railroad depot and property, and not to enter the town.

An hour later I received a communication from the United States consul, Mr. Long, a copy of which is herewith transmitted, marked A, calling upon me to send an armed force of one hundred and fifty marines into the town for the protection of himself and others.

As it was near night when the request reached me, I deemed it unwise to comply with it, as I could not feel justified in landing and marching through a strange city at night the force asked for; and, besides, I considered that I had no right to land men on the soil of a friendly power without the consent of the authorities.

The day following, a deputation of gentlemen, bearing a letter signed by the most respectable and influential American and foreign citizens of Panama, and accompanied by a letter from the United States consul, (copies of which are enclosed, marked B, C,) requesting that for their protection and that of their property I would place in the town an armed force of one hundred men, stating at the same time that the chiefs of the contending parties had given their consent that this should be done. It was also represented to me that the moral effect of the presence of a respectable force from this squadron would tend materially to inspire confidence and prevent any lawlessness on the part of evil-disposed persons.

In compliance with this request, I increased the force then on shore to two hundred marines and blue-jackets, with four pieces of artillery, to be equally divided between the city and the railroad station.

Captain Upshur placed this force under the immediate command of Lieut. Commander P. F. Harrington, of this vessel, and Lieut. Commander Theo. F. Jewell, of the Tuscarora, as will be seen by his letter to me, a copy of which is inclosed, marked D.

On the 9th instant a truce was asked for by the Correoso party, with

a view to burying their dead, which was granted. Subsequently an appeal was made to the foreign consuls by both parties to use their influence toward a cessation of hostilities, but they declined doing so, deeming it prudent to abstain from any interference.

The Correoso party then agreed to disarm, naming an hour, which was postponed from time to time, but eventually there was a surrender of their arms, and now all is quiet.

The political affairs of this state are in such a muddle that I am wholly unprepared to give any lucid explanation of the causes which have led to this last *émeute*. I send herewith editorials from the Panama Star and Herald, the local paper of the Isthmus. The statements, so far as I can judge, are correct.

The killed and wounded in the strife foot up one hundred, more than half of whom were killed.

It gives me pleasure to state that the conduct of our officers and men, with a few exceptions among the latter, has been most commendable.

* * * * * * *

Very respectfully, your obedient servant,

CHAS. STEEDMAN,
Rear-Admiral, U. S. N., Commanding U. S. Naval Force, South Pacific Station.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

A.

UNITED STATES CONSULATE,
Panama, May 7, 1873.

SIR: A deplorable state of matters in Panama requires the presence of not less than one hundred and fifty marines to protect American interests during the night. I have informed both parties of my intention to appeal to you for ample protection.

I have the honor to be, your obedient servant,

OWEN M. LONG,
United States Consul.

Rear-Admiral STEEDMAN,
Commanding United States Naval Forces, South Pacific.

P. S.—During the night the signal for additional aid will be three rockets, followed, after a short interval, by three more.

B.

UNITED STATES CONSULATE,
Panama, May 8, 1873.

SIR: I beg leave to introduce to you the gentlemen who are bearers of this communication. They represent the various interests centered in business in this city. Many of the names are those of Americans who have their families and fortunes in this city. They can give you a thoroughly accurate statement of the present condition of affairs in this city.

I have the honor to be, with respect and esteem, your obedient servant,

OWEN M. LONG,
United States Consul.

Rear-Admiral CHAS. STEEDMAN,
Commanding United States Naval Forces, South Pacific.

C.

PANAMA, *May* 9, 1873—8 a. m.

SIR: The undersigned, foreign residents in Panama, beg to acquaint you of the fact that since 12 noon yesterday a contest has been going on in this city between the federal troops stationed here for the protection of the transit, and the state forces; that indiscriminate firing, endangering the lives of all residents, has continued since the hour before mentioned; that both parties threaten that sooner than surrender, they will fire the town; and that even if this threat be not carried out, it is to be feared that great excesses will be committed by either party which may be victorious; that the lives and property of the whole of the undersigned will be seriously imperiled if such excesses are committed; that the landing of an armed force of any foreign power here is of more value as a moral force than any other step that can be adopted; and that they therefore beg you, as commander of the only foreign force here, and the chief naval representative of the United States of America, with which power Colombia has treaties providing for such emergencies, to at once send such a force on shore as shall put a stop to such perilous and anomalous state of affairs.

H. SCHUBER,
JAS. BOYD,
F. EDMUNDS,
D. M. CORWINE,
GEO. REICKER,
H. M. KEITH,
D. GOLDSMITH & CO.,
S. L. ISAAC and ASH,
G. W. PIERCE,
S. L. LANGSBURGH & CO.,
HENRY EHRMAN,
BOSTON ICE COMPANY,
And many others.

Rear-Admiral CHARLES STEEDMAN,
Commanding United States Naval Forces, South Pacific.

D.

SOUTH PACIFIC STATION,
UNITED STATES FLAG-SHIP PENSACOLA,
Panama, U. S. C., May 13, 1873.

SIR: In obedience to your order, I have to report that a force of one hundred blue-jackets and marines, with two howitzers, were landed from this vessel and Tuscarora on the 7th instant, at the railroad station, with orders to protect the buildings and property therein stored, and that subsequently, by your further orders, one hundred additional men and officers were landed, with two howitzers. This force was placed under the command of Lieut. Commander P. F. Harrington, and equally divided, one hundred being left at the depot, under the immediate command of Lieut. Commander T. F. Jewell, of the Tuscarora, and one hundred placed within the city, a detail from the division being sent to the United States consulate for its protection, the whole under the command of Lieut. Commander P. F. Harrington.

The moral effect of the presence of this force was, as you had foreseen, to inspire confidence, affording security to the lives and property of American and other foreign merchants and residents, and exercised a measurable restraint over the belligerents.

Hostilities between the contending parties having ceased on the 10th, it was deemed expedient to keep our force *in statu quo;* however, the civil authorities of the town being re-established on the day follow-

ing, a request was made that our people be withdrawn from the city, which was complied with, but a sufficient force continued at the railroad depot. I therefore withdrew from the town and returned to the United States steamer Tuscarora her men and officers. I have left at the railroad station sixty men and two howitzers, under the command of Lieut. T. B. M. Mason.

In closing this report, I beg leave to call your attention to the thorough, satisfactory, and able manner in which our operations on shore have been conducted, all the more delicate from the fact that we were neutrals. To Lieut. Commander P. F. Harrington and Lieut. Commander T. P. Jewell, and to the officers and men under their command, great praise is due for the intelligent, earnest, and complete manner in which the duty you have given them has been performed. It has excited much remark on shore, and met with universal commendation. Lieut. Commander P. F. Harrington and Lieut. T. B. M. Mason, and the officers and men of the ship, forming very much the largest part of the force on shore, have come more directly under my observation, and it gives me great pleasure in mentioning the zeal and discipline they have manifested under circumstances well calculated to try both officers and men, and gives ample proof that the crew of a well-organized ship can, when required so to do, perform on shore all the duties of a well-trained soldier.

Very respectfully,

J. H. UPSHUR,
Captain and Chief of Staff.

Rear-Admiral CHARLES STEEDMAN, U. S. N.,
Commanding United States Naval Force, South Pacific Station.

SOUTH PACIFIC STATION,
UNITED STATES FLAG-SHIP PENSACOLA, (2d rate,)
Bay of Panama, U. S. of C., October 6, 1873.

SIR: In my dispatch No. 1, dated the 22d of September, 1873, I informed the Department that I had on that day relieved Rear-Admiral Steedman, in command of the United States naval force on the South Pacific station.

I was not long permitted to be idle and without something to do. A revolution had been brewing in Panama and vicinity for some weeks.

* * * * * * *

On the 24th of September affairs seemed to be approaching a crisis. In the afternoon of that day, I landed a force of one hundred and thirty men, well armed and equipped with howitzers and rifles, under competent officers, and stationed them at the Panama Railroad depot for its protection, and to be ready to furnish escorts on the railroad trains to Aspinwall to guard the passengers and specie which were being daily transported over the road.

The President of Panama had previously notified the United States consul that, under the present circumstances, he was unable to give the Panama Railroad that protection and safeguard guaranteed in the treaty.

This movement was quite opportune, as that night at midnight the "ball opened," and the conflicting forces commenced firing upon each other, about two miles outside of the city, but it did not prove serious to either party.

The firing was resumed and continued at intervals the following day, and has continued up to this time of writing.

I afterward increased the force on shore to one hundred and ninety men, stationing detachments to protect the American consulate and other American houses and American property.

There are now four lines of steamers communicating with Panama, viz, the American, (two lines, the San Francisco and the Central America,) English, and the French, whose passengers, freight, and specie have to be transported over the Panama Railroad. By care, attention, and hard work, the American naval force has securely protected the transit and passengers, and their effects have been, up to this time, transported over the railroad without any delay.

The United States ship Benicia, Capt. A. G. Clary, of the North Pacific squadron, happened in here very opportunely, and the ship and officers have done good service in rendering me important aid.

Lieut. Commander J. D. Graham, the executive officer of the Benicia, has commanded the forces stationed at the city, and Lieut. Commander Allen D. Brown, the executive officer of the Pensacola, has command of the forces at the railroad. Both of these officers have performed their duty with good judgment and efficiency.

* * * * * * *

October 8.—*Later.*—On the 6th instant hostilities ceased, the outside or besieging party, under General Correoso, withdrawing a few miles into the interior, being deficient in ammunition and other supplies. This enables us to move about without the fear of being hit by bullets from one party or the other.

In course of time revolutionary movements will, perhaps, be again the order of the day.

There is not the necessity for keeping so large a force on shore, and I have withdrawn all but thirty men to the ships.

A small force is still required, at least for a few days, as a precautionary measure at the railroad depot, and to guard the road in case of the re-appearance of the revolutionary forces.

The mail-steamer is just in from San Francisco, and I shall see that the passengers, mails, specie, baggage, and freight are all conveyed without molestation over the road to Aspinwall to-day.

I am, sir, very respectfully, your obedient servant,

JOHN J. ALMY,
Rear-Admiral, U. S. N., Commanding United States Naval Force, South Pacific Station.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

No. 16.

MERITORIOUS SERVICES AND CONDUCT.

UNITED STATES STEAMER COLORADO, (1st rate,)
FLAG-SHIP ON THE ASIATIC STATION,
Hong-Kong, China, November 5, 1872.

SIR: I have the honor to forward to the Department a copy of a letter from Commander R. R. Wallace, commanding, reporting an act of distinguished gallantry done by Lieut. Commander Douglas Cas-

sel, United States Navy, executive officer of the United States steamer Ashuelot.

Knowing from my own recent observation of the Pei-Ho River, at Tien-Tsin, the great personal peril which Lieutenant-Commander Cassel unhesitatingly incurred in jumping into the always rapid, and, at the time of the occurrence, the swollen and turbulent current, to rescue from drowning one of the ship's company, I beg leave to represent his act as of the most honorable, manly, and courageous kind.

But for Lieutenant-Commander Cassel's very prompt, self-reliant, and self-forgetful action, the carpenter's mate, who had fallen overboard while in the discharge of his duty at general quarters, would inevitably have been drowned; and but for his coolness, resolution, and strength, Lieutenant-Commander Cassel himself might have met the same fate.

I have the honor and pleasure to respectfully commend Lieutenant-Commander Cassel's heroic action to the special notice of the honorable Secretary.

Very respectfully, your obedient servant,

THORNTON A. JENKINS,
Rear-Admiral, U. S. N., Commanding U. S. Naval Force on the Asiatic Station.

Hon. GEO. M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES STEAMER ASHUELOT, (3d rate,)
Tien-Tsin, China, October 14, 1872.

SIR: I have the honor to inform you that during exercises at general quarters this morning the carpenter's mate was sent over the side to plug a shot-hole. The lanyard to the slings was not well secured, and, as soon as a strain was brought on it, it sundered, and he fell overboard. He would have been drowned, (as he had on a heavy pair of canvas-slings, tools, &c., which rendered him helpless,) but for the prompt assistance of Lieut. Commander Douglas Cassel, who jumped overboard and succeeded in getting him on the port quarter-post, and kept him there until a boat could be got to them. Mr. Cassel's gallant conduct is worthy of the highest praise. Had he missed the quarter-post, they would both have been drowned, as the current was so strong it would have been impossible to have kept afloat, loaded down as they were, long enough to get a boat to them.

I am, sir, very respectfully, your obedient servant,

R. R. WALLACE,
Commander, Commanding.

Rear-Admiral THORNTON A. JENKINS,
Commanding United States Naval Force on Asiatic Station.

NAVY DEPARTMENT, *January* 6, 1873.

SIR: I take great pleasure in furnishing you with a copy of dispatch, dated the 29th of November last, received by the Department from Rear-Admiral Thornton A. Jenkins, commanding the United States naval force on the Asiatic station; also, with a copy of a report which accompanied it, relative to your heroic conduct in saving from drown-

ing the carpenter's mate of that vessel, who fell overboard into the river Pei-Ho, near Tien-Tsin, during exercise at general quarters.

It is very gratifying to the Department to receive and place on its files such evidence of the self-sacrificing spirit and devotion of the officers of the Navy, and any acknowledgment which it could make of it would scarcely be so satisfactory to you as the appreciative and complimentary letter of the commanding officer of the station.

This instance of your coolness and courage gives additional luster to your history as recorded in the official reports of your services in the face of the enemy at the capture of the Corean forts.

Very respectfully,

GEO. M. ROBESON,
Secretary of the Navy.

Lieut. Commander DOUGLAS CASSEL,
United States Steamer Ashuelot, Asiatic Station.

UNITED STATES STEAMER OMAHA, (2d rate,)
At Sea, lat. 37° 6′ *S., long.* 52° 2′ *W., January* 7, 1873.

SIR: I have to report the death of John Owens, rated a carpenter, on board of this vessel.

The death of the above-named John Owens occurred on the 7th day January, 1873, at sea, and in the line of duty.

While at work on the fore-topsail yard the standing part of the runner gave way, letting the yard down by the run, and jerking Owens overboard, after striking the rail of the pivot-gun port with such force as to break it. As he floated by the after part of the ship, Lieut. Seth M. Ackley seized a rope and sprang overboard to his assistance, succeeding in getting hold of him, but unable to retain it or the rope on account of the vessel's headway. The man sinking, Mr. Ackley swam to the life-buoy, and was brought on board by life-boat, uninjured.

I would respectfully call the attention of the Department to Mr. Ackley's gallant attempt to save life.

Very respectfully, your obedient servant,

JNO. C. FEBIGER,
Captain, Commanding.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

NAVY DEPARTMENT, *May* 2, 1873.

SIR: Your commanding officer, Captain Febiger, has very properly considered it his duty to report to the Department your gallant conduct on the 7th of January last, in endeavoring, at the imminent risk of your life, to rescue one of the crew of the Omaha from drowning.

One who is capable of such an act of chivalry, or rather of philanthropy, backed by intrepidity, does not need the applause of the world. Providence takes care to give a due and sufficient reward. But it is the duty of the Department to assure you, and leave it on record, that your generous disregard of self is known and appreciated.

Very respectfully,

GEO. M. ROBESON,
Secretary of the Navy.

Lieut. SETH M. ACKLEY, U. S. N.,
United States Steamer Omaha, South Pacific Station.

WASHINGTON, D. C., *January* 26, 1873.

SIR: I beg leave to call the attention of the Department to the gallantry, good conduct, and good judgment displayed by Lieut. W. H. Brownson upon the occasion of the boat expedition under his charge from the Mohican, as detailed in my report under date of June 19, 1870, and respectfully to suggest that a few words of commendation from the Department to Lieutenant Brownson and the officers and men of the expedition, indicating the appreciation of the Department of the successful performance of a dangerous and difficult service, would be an encouragement and a satisfaction to themselves and an incitement to others in their career in the service.

I have the honor to be, very respectfully, your obedient servant,

W. W. LOW, *Captain.*

Hon. GEO. M. ROBESON,
Secretary of the Navy, Washington, D. C.

NAVY DEPARTMENT, *March* 3, 1873.

SIR: The Department is always pleased in appropriately acknowledging the meritorious services of the officers and seamen of the Navy, and regrets to find, on recurring recently to the circumstances of the destruction of the piratical cruiser Forward, in Tencapau River, January 17, 1870, that it omitted to express to you, and through you to those who composed the expedition under your command, its appreciation of the good judgment, good conduct, and gallantry displayed on the occasion.

It therefore gives it pleasure, even at this remote day, to supply the omission, and to say that the reports of Commander Low, who commanded the Mohican, and of yourself, indicate that promptness, discretion, and bravery marked the expedition from its inception to its termination.

Having, in the appendix to my annual report of 1870, expressed the satisfaction of the Department with the result of the expedition, and published in full the detailed reports concerning it, it is deemed unnecessary to mention here, by name, those who shared with you its dangers and honors, and those who lost their lives in protecting the flag and commerce of the country. Their fidelity and gallantry are unextinguishably recorded in those reports, which have become a part of the nation's history.

To you and all others concerned in the expedition, the Department expresses its grateful acknowledgments.

Respectfully,

GEO. M. ROBESON,
Secretary of the Navy.

Lieut. W. H. BROWNSON,
Naval Academy, Annapolis, Md.

No. 280.] UNITED STATES NAVY-YARD, NEW YORK,
Commandant's Office, November 8, 1873.

SIR: I have the honor to forward herewith, for the favorable consideration of the Department, a letter from Lieutenant Schetky, addressed

to Captain Low, and by him referred to me, commending the conduct of John Dempsey, ordinary seaman, belonging to the crew detailed for the Kearsarge.

I respectfully suggest that a medal of honor would be a suitable recognition of Dempsey's gallantry and good conduct.

I am, very respectfully, your obedient servant,

S. C. ROWAN,
Vice-Admiral, Commanding.

HON. GEO. M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES RECEIVING-SHIP VERMONT,
Navy-Yard, Brooklyn, November 6, 1873.

SIR: I have the honor to report the following case of good conduct and bravery on the part of John Dempsey, ordinary seaman:

While on board the United States tug Rocket, waiting transfer to the Pacific mail-steamer Grenada, for transportation to Mare Island, California, having been drafted for the United States steamer Kearsarge, James Hayes, ordinary seaman, accidentally fell overboard, and being unable to swim, was in danger of drowning. John Dempsey, without hesitation, sprang overboard and supported Hayes until a line could be passed him, when both were safely landed on board the tug.

Very respectfully, your obedient servant,

C. A. SCHETKY,
Lieutenant United States Navy.

Capt. W. W. LOW, U. S. N.,
Commanding U. S. Receiving-Ship Vermont, Navy-Yard, Brooklyn.

No. 61.] OFFICE COMMANDER-IN-CHIEF SOUTH PACIFIC STATION,
UNITED STATES FLAG-SHIP PENSACOLA, (2d rate,)
Bay of Coquimbo, Chili, August 22, 1873.

SIR: It is with pleasure I forward the inclosed copy of a report made by Capt. John H. Upshur, detailing the gallant conduct of Patrick Regan, ordinary seaman, in saving a shipmate from drowning, and beg that the Department may be pleased to notice his conduct.

Very respectfully, your obedient servant,

CHARLES STEEDMAN,
Rear-Admiral United States Navy,
Commanding United States Naval Force, South Pacific Station.

HON. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

SOUTH PACIFIC STATION,
UNITED STATES FLAG-SHIP PENSACOLA,
Harbor of Coquimbo, Chili, July 30, 1873.

SIR: I am pleased to call your notice to the brave and honorable conduct of Patrick Regan, ordinary seamen of this ship, in saving a shipmate from drowning.

During the prevalence of a "norther" at this port this morning Peter Linguist, ordinary seamen, fell from the lower boom, when attempting to come on board from one of the ship's boats. As he rose from the water the boat struck him on the head and stunned him. He had large top-boots on, and was otherwise heavily clothed, and, becoming insensible, Linguist was drowning.

At that moment Regan observed the accident from the gun-deck, and he at once jumped out of a port, and swam to the rescue, and had the happiness to save the man's life.

Though in humble life, the man Regan has been truly noble, and I am sure you will commend his conduct.

Very respectfully, your obedient servant,

J. H. UPSHUR,
Captain, Commanding.

Rear-Admiral CHARLES STEEDMAN, U. S. N.,
Commanding United States Naval Force, South Pacific Station.

NAVY DEPARTMENT, *Washington, October* 6, 1873.

SIR: Rear-Admiral Steedman, commanding the United States naval force on the South Pacific station, forwarded to the Department, August 22 last, a report made by Capt. J. H. Upshur, commanding the flag-ship PENSACOLA, of your brave and honorable conduct in saving a shipmate from drowning.

The Department is pleased to hear of your heroic, humane, and successful efforts, which will be mentioned in a general order.

A medal of honor will be given you.

Very respectfully,

WM. REYNOLDS,
Acting Secretary of the Navy.

Mr. PATRICK REGAN,
Ordinary Seaman, United States Steamer Pensacola,
South Pacific Station.

No. 52.] UNITED STATES FLAG-SHIP LANCASTER, (2d rate,)
Rio de Janeiro, Brazil, October 24, 1872.

SIR: I have the honor to inclose herewith a copy of a letter from Captain Caldwell, of this ship, in regard to the gallant conduct of James A. Rodney, ordinary seaman, and John O'Brien, seaman, who jumped overboard to assist a man who fell from aloft and was severely injured. In my opinion, the conduct of the former probably saved the life of the injured man.

I beg leave to suggest to the Department the propriety of noticing, in some public manner, the conduct of the two men named above.

I am, sir, very respectfully, your obedient servant,

WM. ROGERS TAYLOR,
Rear-Admiral, U. S. N., Commandiny United States Naval Force,
South Atlantic Station.

Hon. GEO. M. ROBESON,
Secretary of the Navy.

UNITED STATES FLAG-SHIP LANCASTER, (2d rate,)
Rio de Janeiro, Brazil, October 22, 1872.

SIR: I have respectfully to report that while furling sail Charles Beckman, seaman, fell from aloft, struck a gun in his descent, which inflicted a severe wound on his head, and then tumbled overboard. Immediately on his striking the water, James A. Rodney, ordinary seaman, very gallantly jumped overboard and brought the wounded man to the grab-rope, and supported him there until a boat could be sent to his assistance. John O'Brien, seaman, also jumped overboard and rendered timely assistance.

Very respectfully, your obedient servant,

C. H. B. CALDWELL,
Captain.

Rear-Admiral WM. ROGERS TAYLOR, U. S. N.,
Commanding United States Naval Forces, South Atlantic Station.

I hereby certify that the above is a true copy.

JOHN F. BUST,
Clerk South Atlantic Station.

UNITED STATES STEAMER, POWHATAN, (2d rate,)
Norfolk Harbor, Virginia, December 27, 1872.

SIR: I have the honor to bring to the notice of the Department the gallant conduct of Joseph B. Noil, seaman, (negro,) one of the crew of this vessel.

The circumstances are as follows: On yesterday morning the boatswain, I. C. Walton, fell overboard from the forecastle, and was saved from drowning by Joseph B. Noil, seaman, who was below on the berth-deck at the time of the accident, and hearing the cry "Man overboard," ran on deck, took the end of a rope, went overboard, under the bow, and caught Mr. Walton, who was then in the water, and held him up until he was hauled into the boat sent to his rescue.

The weather was bitter cold, had been sleeting, and it was blowing a gale from the northwest at the time.

Mr. Walton, when brought on board, was almost insensible, and would have perished but for the noble conduct of Noil, as he was sinking at the time he was rescued.

Very respectfully, your obedient servant,

PEIRCE CROSBY,
Captain, Commanding.

Hon. GEO. M. ROBESON,
Secretary of the Navy, Washington, D. C.

Respectfully forwarded.

C. H. DAVIS,
Rear-Admiral and Commandant.

UNITED STATES STEAMER POWHATAN, (2d rate,)
Key West, May 16, 1873.

SIR: I beg leave to bring to the notice of the Department the heroic conduct of Francis Gallagher, landsman. The facts are as follows: On

the 29th of April, while swaying aloft top-gallant yards, the jack-block through which the fore-top-gallant-yard rope was run—carried away, striking Francis Gallagher, landsman, and Thomas Dyer, coxswain, who were at the time standing on the top-mast cross-trees, and injuring them severely. The latter, Dyer, lost his balance, and was in the act of falling, when Gallagher, notwithstanding he was severely hurt, by his great presence of mind, caught Dyer and held him until assistance could be sent.

Had it not been for the instantaneous action of Gallagher, Dyer would have, without doubt, been killed by falling to the deck.

Very respectfully, your obedient servant,

PEIRCE CROSBY,
Captain, Commanding.

Hon. GEO. M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES FLAG-SHIP WABASH, (1st rate,)
Ville Franche Harbor, November 13, 1873.

SIR: I have the honor to inform the Department that while this vessel was moored in Barcelona Harbor on the 5th of October, 1873, Patrick Sullivan, quartermaster, rescued from drowning Frank Westphale, ordinary seaman.

The circumstances were as follows: While one of the stern-boats was being hoisted the after-fall unhooked, and the boat fell about 20 feet to the water. There were two men in the boat at the time, one of whom, Westphale, was unable to swim. He made vain efforts to keep on the surface, and could just be seen beneath the surface struggling, but gradually sinking, when Patrick Sullivan went down the stern-ladder, dropped into the water, grasped him and held him until a rope was thrown him. About the same time a boat from Her Britannic Majesty's steamer Pallas, which was lying close to us, reached the spot.

I would also state that Frank Davis, one of the crew of the Pallas, seeing the men struggling in the water, jumped overboard and attempted to reach the spot in time to be of assistance.

I am, sir, respectfully,

S. R. FRANKLIN,
Captain, Commanding.

Hon. GEO. M. ROBESON,
Secretary of the Navy, Washington, D. C.

No. 17.—REPORT OF ADMIRAL PORTER.

WASHINGTON, D. C., *October* 22, 1873.

SIR: I have the honor to state that since my last report ten ships of war have been inspected before going to sea and found to be properly fitted out, and in nearly every case an improvement over the previous year.

I do not know that anything more is to be desired in the manner of preparing vessels for sea, except that further facilities for saving life should be provided.

I have not yet heard of any ship in commission that had the means, in case of fire or other accident, of providing for the safety of her crew by boats or life-rafts, for it is quite certain that in the hurry of a fire or collision proper rafts could not be improvised.

The last thing at an inspection is to see what facilities a ship has for saving her crew, a much more important problem at present than in former times, when torpedoes were not used in naval warfare, yet, as I said before, in no instance has a United States vessel been found provided with the means of saving those on board, and our boats are, for this purpose, in many instances even inferior to those of ocean passenger steamers.

I have referred to this important subject in several reports to the Department, and again recommend that it receive the attention it merits.

No ship can carry boats enough to save her crew in a heavy sea, but life rafts can be fitted in such a way as not to encumber the vessel or injure her appearance, and with their aid the entire ship's company could be saved.

Some officers object to those life-saving appliances as unsightly, and make any excuse to leave them behind; and the gutta-percha rafts are stored away in boxes unused, and without ventilation, until they become unserviceable.

I would therefore recommend that every vessel in the Navy should have a monthly exercise, to test the efficiency of the means at hand for transporting the crew, the result of which should be reported to the Department. I venture to say that at every trial some useful experience will be gained, and in case of the destruction of any of our ships by torpedoes, the good effects of such practical experiments would be seen.

The best life-rafts are those of Commodore Ammen, Mason & Rogers, Torrey's Gutta-Percha, and the Hammock Life-Preserver, the latter recommended by Mr. R. B. Forbes, a gentleman who, at his own expense, has undertaken experiments in life-saving apparatus which should properly be conducted by the Government.

These experiments of Mr. Forbes's have shown the way to save life at sea under all circumstances, and if the results are adopted they will prove very satisfactory to those who have to encounter the perils of the ocean.

Nine ships have been inspected on their return from sea, and all were found in creditable condition. This speaks well for the commanders and officers, who have had a pretty hard time in maintaining discipline among the cosmopolitan sailors who man our ships, with rules scarcely stringent enough even for times of peace.

CREWS.

In examining the quarterly returns of inspections, I find the universal excuse for deficiencies "shortness of crew," and although in some cases this excuse is hardly admissible, yet, on the whole, our ships' companies are about 15 per cent. below the complement, which should not be the case with vessels of war.

The calculations for our ships' crews have already been very closely made without, as in former times, allowing any supernumeraries. Consequently the loss of ten working-men will be felt even in the largest of our vessels, and a single man would be missed in a small one. Yet, if a commanding officer should experience defeat owing to the shortness of his crew, I fear he would meet with little sympathy on that account.

In my last report to the Department I nearly exhausted this subject; but as no remedy to the growing evil has yet been applied, I again beg

leave to suggest that some legislation be procured from Congress for properly manning the Navy, both as regards numbers and material.

After careful study and many years' experience at sea, I adhere to the opinion heretofore expressed from time to time in my reports to the Department, that an apprentice system, based onthe plan I lately submitted to you, should be adopted for the service.

It has hitherto been thought that our merchant-marine would be a school from which we could always recruit seamen, whereas the Navy is now actually the school from which merchants obtain their best men, and the wages in the mercantile marine are so much better than those in the Navy that no inducements held out by the latter are sufficient to keep men in the Government service.

Seamen naturally go where they can get the highest pay. They find the merchant service more remunerative and more desirable than the Navy, which men enter deeply in debt for an outfit which should be furnished them free of cost.

It is possible that, after adopting the apprentice system now existing in the British navy, we might at the end of five years' apprenticeship, still be furnishing men for the merchant service, but in time of war we would get them back again, and would then experience the benefit of having seamen educated in the Navy and attached to their country and flag.

In all probability a large number of apprentices would elect to remain in the naval service and enjoy the benefits arising from continuous employment.

At all events, no harm could result from the adoption of the apprentice system, and we should secure a larger number of native Americans than are at present in service, for frequently on the return of a United States vessel from a cruise, about the only nationality she has is in her officers and the flag flying at her peak.

My last report was very full upon this subject, and gave indisputable facts to corroborate what I now write.

BATTERIES OF VESSELS.

I beg leave to call your attention to a defect in some of the smaller vessels which has on several occasions been noticed by the inspecting-board, and which is obvious to naval officers generally; that is, the batteries are too heavy for the vessels and the guns too large for the breadth of beam. This applies more particularly to the nine-inch guns on board vessels of the Plymouth class, and those of smaller tonnage. The breadth of beam does not allow the working of the nine-inch guns to advantage, and in time of action they would be knocked to pieces against the coamings. Without referring to other disadvantages, I recommend that a suitable eight-inch gun be substituted for the nine-inch.

There is but little difference in the weight and range of the eight-inch shot, and its effects against a wooden vessel would be almost as destructive as the nine-inch. Neither gun would have any effect against an ordinary iron-clad unless accidentally striking some very vulnerable part.

Some of the vessels to which I have alluded could probably carry a couple more of the eight-inch guns in consequence of their lighter weight, owing to a decrease of caliber. The eight-inch gun could also be more rapidly handled with a smaller number of men, and in my

opinion at ordinary range, ten eight-inch would be superior to eight nine-inch guns.

It is a disputed point with some officers what constitutes heavy guns, but an eight-inch should certainly be considered in that category, as it is one of the favorite pieces of the service, and only a few years ago but four of them were placed on board our largest frigates.

STEAM CAPSTANS.

In my last report I drew your attention to the want of steam capstans in the navy, and gave reasons for their use. I recommend their adoption in the ships now building, for no ships of war can be thoroughly efficient without them.

I also mentioned the necessity of building more buoyant steam-cutters, of models better adapted to a heavy sea, such as they are often obliged to encounter. The machinery and boilers of our cutters are now all that is required and are capable of driving boats of larger size.

ALLOWANCES OF OFFICERS.

Of late years some improvements have been made in the cabin allowances of our naval vessels, but the increase in the cost of living abroad causes officers to incur expenses far beyond their means, and at the end of a cruise they are often deeply in debt.

The pay of officers may appear liberal to those living in retired places, but when it is remembered that an officer has to provide for his family on shore during his absence from home, and accept and return the hospitalities of foreign officials without any allowance from Government, a different opinion must prevail.

Naval men are proverbially hospitable, and European governments, desiring their officers to be so, afford them the necessary means. The cabins are provided with the requisite furniture, and the tables fitted even to the smallest particulars. Our policy should be equally liberal. Such a system makes an officer very independent, enabling him to leave home, at a moment's notice, to join a ship in any part of the world, without encumbering himself with troublesome effects and going to an expense he can ill afford.

To show the difference between the pay of our own and foreign officers, I will compare the grades of rear-admiral in the navies of the United States and Great Britain.

The pay of an officer in the British navy is given for the support of himself and family, but to prevent the commander of a vessel being put to pecuniary inconvenience, thereby impairing his usefulness, the government allow table-money and other emoluments.

Thus, a rear-admiral or commodore of the first class receives $5,475, with an allowance of $8,210 for table-money, servants, &c., amounting in all to $13,685 per annum, or more than twice the full pay of one of our rear-admirals afloat.

This difference is still greater when it comes to the pay of higher officers. For instance, an admiral of the fleet receives $19,160, and a vice-admiral $15,510, beside other allowances.

In addition to the above, all commanding officers are allowed table-money for entertainments, which enables them to leave a sufficient amount of pay at home to support their families.

From this it will be seen how inadequate would be considered by other governments the pay of our commanding officers.

I doubt if we have an admiral, captain, or commander afloat who is not sorely pinched on account of the various calls upon his hospitality, and duty on shore is so much more agreeable and less oppressive that officers naturally hesitate to seek sea-service.

Some may urge that our officers abroad are not obliged to incur these expenses; but it would not look well for the commander of a United States vessel of war, after partaking the hospitalities of foreign officers, to get up his anchor and steam out of port to avoid reciprocating.

Courtesies between officers tend to cement the bonds of good feeling which nations should experience towards each other, and they should therefore receive the greatest encouragement.

On two occasions within my knowledge, the Department of State has paid out some $10,000 to enable the commanding officer of the European squadron to return civilities and do honor to our country, and these precedents it would be well to follow. It is not just that officers out of a pay only sufficient for the support of themselves and families should be subjected to any expense in returning hospitalities which are absolutely of a national character.

I speak in behalf of the Navy, having no personal interest in the matter, and trust that a liberal view will be taken of the subject and every possible allowance made to prevent our officers abroad from being placed in embarrassing positions and subjected to unnecessary expense.

This subject naturally belongs to Congress, but the Navy Department can in a measure regulate the matter of allowances and add to the comfort of commanding officers abroad as well as those in command of shore stations.

FLAGS.

A petition has been numerously signed by officers of the Navy, including myself, asking that the flags of Admiral, Vice-Admiral, and rear-admiral which were in use during the late war, together with the old broad pendant, be restored to the service to take the place of the flags now worn. The present flags are distasteful to the officers and men, and do not afford the distinction between grades that they were originally intended to effect.

There are traditions connected with the old flags that are dear to the officers and men who served in the war for the Union, and we do not wish to relinquish those familiar objects.

Admiral Farragut was allowed to retain the flag under which he had gained his renown, but at his death it was abolished, and the Navy now asks that it may be resuscitated. The younger officers now coming forward will look up to the old flag with more pride than to the one at present in use, which signifies nothing at all.

It was incorrectly supposed, at the time the change of flags was made, that I was responsible for it, but I never liked the new flag. The alteration was, however, deemed advisable by the chief of Bureau having charge of such matters, on the ground that the new flag would assimilate with the uniform system adopted by foreign nations. This was a fact, but as there was a national sentiment connected with the old flag, I think the substitution unadvisable.

The new flag having been tried for some years, and giving no satisfaction, the officers of the Navy petition strongly for the change, which I trust you will grant.

TORPEDOES.

The torpedo system has occupied my particular attention during the past year, and although much engaged in matters relating to the build-

ing of the new torpedo vessel, I have yet found time to investigate the experiments made in other quarters.

I am confirmed in my opinion that the torpedo system, although still in its infancy, is destined to play a most important part in future naval warfare, so that the nation most advanced in torpedo science will possess great advantages over all others.

To us, who seem to experience so much difficulty in maintaining a Navy, it is absolutely necessary that we should devote more time and attention to the subject of torpedoes than other nations, and make a liberal outlay for this purpose.

I regret to say that there is much less interest displayed in this question, in our Navy, than its importance deserves, for I know of but two vessels that have gone to quarters and fired their torpedoes the same as if in action.

I am convinced that proper attention will not be given to this subject until special instructions are issued from the Department.

Although the theoretical instruction hitherto given at the torpedo station has been of a very interesting kind, I think a larger amount of practical experiments could be substituted for it with advantage. Officers would naturally feel more interest in actual practice than in mere theory. I have conversed with several who have been under instruction at the station, and although they express themselves pleased with the information they have gained, they seem on the whole not sorry to have (as they suppose) "finished with the business."

In my opinion, no one can make a good torpedo officer unless his heart is in the work, and hence I believe it well to make the duty as attractive as circumstances will admit.

At present the torpedo station is a theoretical school without sufficient practice, and the experiments are not altogether suited to impress the students with the importance of the work on which they are engaged. I am pleased to say, however, that some very good and useful practice has lately been had at Newport while fitting the Monongahela, which will do more to impress the officers and crew of that ship with the power of torpedoes than anything else could have done.

A number of officers would like to go to Newport for instruction, but some of the rules of the station seem to them inconsistent with the relations that should exist between seniors and juniors where the latter are superintendents and instructors.

Now, in foreign navies—in that of England, for instance—torpedo instruction is under the immediate supervision of a rear-admiral or other officer of rank, who has the opportunity of selecting the best talent in the service as assistant instructors. Two rear-admirals, ten commodores, and a large number of captains and commanders are now under instruction in the British navy, and seeing the difficulty in the way of our future progress, I recommend that a like course be pursued by us.

Among all the officers who have studied at the torpedo station, I have met with no one who had invented anything or proposed any improvement on what has been done before. I think this is because they are not sufficiently interested. It should be the policy to encourage an officer to use all his faculties to bring the torpedo system to perfection.

In my several visits to the torpedo-station during the present year, and during my sojourn there of two months, it was evident to me that the means of practical instruction were inadequate. There are only two or three small launches attached to the station, which are not at all suited for the work, and there is no course of instruction whatever for defense against torpedoes.

It is evident that to make the torpedo-school what it should be a more liberal expenditure is required, and the cost of one small ship of war annually for this purpose would be money well spent.

There should be added to the present means of instruction four large steel launches, each 50 feet in length and 10 feet beam, with double screws for quick manœuvering, and all other modern appliances; also the different kinds of torpedoes for harbor defense, the various nets and spars for the protection of vessels against torpedoes, and a good monitor from which to send off the Lay torpedo; for I do not believe ships will come close enough to port to be injured by that device, and we must consequently go off shore to attack them.

In addition to the above, there should be sections of ships, or iron buoys made equally as strong, to test the effect of the different torpedoes fired from the water level to 20 feet below. Specimens of all foreign torpedoes should be bought and tested, and preventives applied against their attack.

Such contrivances as prove good we should adopt into the Navy, and teach our officers how to encounter and use them under all circumstances.

I merely make these suggestions without going into details; but the liberal expenditure of money in this matter of torpedoes would no doubt give birth to many devices not thought of at present.

A great deal of importance has been given to the Harvey torpedo, the Fish torpedo, and the Lay torpedo, and the probability of their destroying ships under all circumstances.

No doubt these inventions are formidable to a certain extent; and a commanding officer, ignorant of the manner in which their attack should be met, would be in danger of losing his vessel; but with an understanding of the subject, and a vessel of equal speed, either of the torpedoes mentioned could be eluded and destroyed.

No towing, diving, or swimming torpedo yet invented is a match for a smart ship, properly armed, with her crew at the guns; and it is for this reason that I recommend the construction of so many large launches to teach officers how to maneuver in attacking and repelling the attacks of torpedoes or torpedo vessels.

Officers would soon find out the difficulty of destroying a ship, properly handled, by means of towing torpedoes, unless the latter were hidden, although it might be easy to blow up a vessel not on the alert, or one improperly handled.

A vessel of equal speed need have little fear of an opponent carrying either the Harvey or Fish torpedo; for these inventions can only be successfully used against ships taken by surprise or lying at anchor.

As a protection against such contrivances I would recommend that all our ships be supplied with 24-pound howitzers to fire at them over the stern and quarter when coming up, or down upon their decks when close on board. An intelligent commander would naturally bring either of these torpedoes astern of his vessel, which it is easy to do in daylight, no matter from what direction they may approach. If from ahead, he can turn on his heel. If from abeam, he can change his course eight points, and the Harvey torpedo-vessel, with all her reels and towing-lines, deck crowded with men, &c., would soon be *hors du combat* unless proof against shot, which could hardly be the case, for a torpedo boat must be light, and able to maneuver quickly.

In fights between two or more ships, as the vessels are always enveloped in smoke, these torpedoes will be extremely formidable, and it will require great ingenuity to guard against their attacks; but the

practice I recommend of maneuvering in steam-launches will teach officers how to provide for every contingency.

Any ship can be arranged with a heavy net all around, from the bowsprit end to the end of the spanker-boom, which, fastened to her lower yards, (the yards resting on the gunwale,) can be kept triced up and dropped just before the Harvey or Fish torpedo gets within striking distance. The torpedo would explode 20 feet from the ship, doing no harm except to the net, which should be of nine-thread ratlin-stuff, with meshes sufficiently small to prevent the torpedo passing through the interstices.

Here, then, is a most important experiment to be tried.

The net-work is the only certain defense a ship can have against anything that dives, although it is a poor protection against a torpedo at the end of a bar, connected with a properly-constructed torpedo-vessel, with appliances for cutting through obstructions.

Such a torpedo-vessel will be the most dangerous to deal with, for there will be no chance to avoid her unless with superior speed. With iron decks and men all under cover, grape-shot would do little damage, and offering but a small target, solid shot would seldom strike the torpedo-vessel, especially at night or in a fog.

Yet all these matters are problems to be worked out only by actual experiment, and we are solving them too slowly.

In the late experiments conducted on board the United States steamer Monongahela, where a hulk was blown up by a spar-torpedo, the ship running for the quarter of the hulk, two large pieces of timber containing several bolts were thrown back on board the ship, together with some smaller fragments. To avoid casualties at such times every ship in the Navy should carry a rope-splinter netting as a portion of her regular outfit.

I feel that I am touching a delicate matter when I refer to the question as to how far naval jurisdiction extends in the protection of our coasts and harbors with torpedoes.

No matter how well drilled a soldier may be, he is never as much at home in a boat or on shipboard as a seaman, nor can an Army officer as well direct the management of a boat or vessel as an officer of the Navy. Torpedoes planted to defend the harbor should be laid down by men accustomed to boats and skilled in the management of lines and tackles. Along the open coast or on the ocean, torpedo duty must of necessity fall to the lot of the Navy.

During the late war the torpedo duty of the enemy afloat was in the hands of rebel naval officers, who managed it with great success, taking into consideration the small means at their command.

In time of war the duty of the soldier defending a harbor is behind the fortifications, to protect with the fire of his guns torpedoes planted to obstruct the channel, for torpedoes unprotected by guns on shore would be of little use, and guns on shore would not prevent the passage of vessels without torpedoes; but in handling torpedoes in boats, in all weathers, seamen alone can be relied upon.

The question then arises, will not the Navy, in the event of war, be called upon to protect our coasts by torpedoes, and ought there not to be a system adopted and provision made to meet future emergencies?

In some countries there is a torpedo-corps, composed of officers and men taken from the Navy, whose sole duty it is to look after the coast and harbor defenses.

I am strongly in favor of such a corps in our Navy, with a permanent

head, the junior officers to serve a length of time equal to that served at sea or on other duty.

The organization of a suitable torpedo corps will necessarily be from the Navy, for the reasons I have stated, and as it will eventually become a very important part of our naval system, we should take advantage of the present opportunity and commence the establishment. It will be rather late when war breaks out to discuss a matter already plain enough to those who have examined the subject, for the enemy would pass the gates while the argument was going on.

In my opinion it is simply the duty of the Army to fire torpedoes from the stations after they have been planted. For this the Army should have the proper appliances, and every means for knowing the arrival of an enemy's vessel over a torpedo-nest.

I have said so much on this subject to show that to the Navy the most important torpedo appropriation, for operating on the water, should be made, and for those torpedoes used on land the appropriation should be given to the Army. Common sense would, indeed, point out that the defense of harbors and coasts, where there are often dangerous bars, reefs, and breakers, with any description of torpedoes in any way connected with a vessel, should be in the hands of the Navy.

A line should be drawn between the duty of the Army and Navy, where one terminates and the other commences, otherwise there will be confusion.

EXERCISES.

I would respectfully call your attention to the fact that the quarterly returns of exercises on shipboard are not as full as the regulations require, or as is desirable for the purpose of maintaining efficient drill. No ship can be a thorough man-of-war unless perfect in all exercises and ready for any emergency. A vessel going into action should be able to strip for the fight in a few moments, for with all her top hamper up and rigging rove she runs the risk of fouling her propeller should a mast be shot away, and crippling her guns by falling spars. Now that battles are fought under steam, there is no longer any necessity for spars aloft in time of action, but constant exercises are necessary to make a ship thoroughly efficient.

Upon one occasion, while in command of the Naval Academy, I saw a sloop-of-war with royal-yard across, rigging rove and sails bent, stripped to her lower rigging, and her rigging all tallied, in seventeen minutes, and this the work of young midshipmen without previous preparation. I have frequently seen the same thing done in half an hour, but I hardly think any of our ships now in commission can do as well.

The reasons assigned by commanding officers for not performing all the exercises do not always seem to me valid, and frequently no explanation at all is given of omissions.

Many complaints are made that the iron-work on board our ships gives way during the exercises, and this is offered as an excuse for not sending up and down top-masts and lower yards, for of course no commanding officer should risk the lives of men on doubtful hooks or bolts.

But there is a simple remedy for this, which is to have every bolt, bar, and hook tested to see what it will bear, and a test-mark put upon it.

When iron breaks it is always the case that it had previously been held together by only about one-fifth of its thickness, the fault of bad forging.

Ships stationed in the tropics have neglected their exercises on the ground of the excessive heat making them oppressive to the crews, but few of the evolutions occupy more than ten minutes, and if the crews are called to quarters daily, cast loose, run in and out the guns and secure, it will do no one any harm.

The sending up and down topgallant yards and masts requires not more than three minutes in the cool of the morning and evening, loosing and furling sails require at the most three minutes, and the sails are quite as well preserved on the yards as in a sail-room, where they are apt to mould and rot. I think these things will strike intelligent officers as they do me.

Upon the whole the exercises as far as they go, considering the shortness of our crews, are fairly performed, but in indorsing the reports of commanding officers, I am obliged to be governed by what is stated therein.

UNIFORM OF SEAMEN.

I notice that the clothing of our seamen does not yet conform to regulations, and that some officers alter it to suit their own taste, which they are not authorized to do.

The present uniform is appropriate, is as inexpensive as it can be made, and clearly indicates the several distinctions among the sailors; yet I have seen the boats' crew of a ship some time in commission wearing three different varieties of uniform, none of them regulation.

The only change I would recommend in the uniform is the abolition of the dungaree collar, now worn on the blue-flannel shirt, and the substitution of blue nankin on the collars of white frocks, in place of dungaree, which changes in washing to all the colors of the rainbow.

STEAM DEPARTMENT.

The seamen-firemen and seamen-coal-heavers substituted in place of the old rates of firemen and coal-heavers, do not like the duty assigned them when steam is raised. The work is unpopular because, as a rule, steam is seldom used, and the extra pay allowed for these occasions will not even compensate for the clothing worn out.

Firemen and coal-heavers being, as one may say, regular denizens of the lower regions in a ship of war, have stow-holes, or boxes, allowed them in which to keep their steaming and coaling clothes, but a seaman has only his bag, which contains his best apparel, and he cannot provide for this extra steam duty.

The result is that most of the seamen-firemen and seamen coal-heavers desert, and I would recommend that the system be changed. The duties are so distinct that it is out of the question to make a good fireman out of a sailor.

SCHOOL-SHIP.

Having visited the Naval Academy practice-ship during the past summer, I beg leave to submit a few remarks in relation to that vessel.

Although a fine ship of her class, I do not think her altogether adapted to the purpose for which she is used. The midshipmen are too much crowded together and thrown too much with the crew, which is not desirable.

When the Tennessee is finished she will make an excellent school-ship, and being provided with the best of engines, will afford the midshipmen and cadet-engineers a fine means of instruction in steam.

If she is kept constantly in commission with a picked crew, the ship will be a good school of discipline, and the importance of having everything on board a ship kept in order will be impressed upon the youthful mind. Besides, the midshipmen would, in such a ship, learn more of the routine of the navy in three months than they would in three cruises in a vessel hastily fitted out and with a green crew on board.

I herewith enclose reports of inspection of receiving-ships and the general condition of vessels of the monitor class. Those of this class that have been reconstructed on the plan I recommended are excellent vessels, much more comfortable and efficient than before, and they will be serviceable for many years to come.

I have the honor to be, very respectfully, your obedient servant,

DAVID D. PORTER,
Admiral.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

Washington, D. C., November 6, 1873.

SIR: As an addition to my report, I beg leave to submit the following in relation to monitors.

Since my last report the Saugus has been completely repaired as recommended, is now an excellent vessel, and is at sea.

The Manhattan has been repaired in a similar manner, and can be got ready for sea in a short time.

The Wyandotte and Nahant are being repaired, and will be finished in six months.

The Canonicus, being repaired in a similar manner, will be ready in three months.

When finished, all the above-named vessels will be much improved, and will last for many years with very few repairs.

The following named vessels of the Nahant class, now at League Island, should be repaired in the same manner as those before mentioned, as they have good hulls and machinery, although rotten in their woodwork: Nantucket, Catskill, Jason, Lehigh, Passaic. These vessels can be repaired in six months by giving the work to separate firms, and would cost $180,000 each.

I beg leave to renew my recommendation with regard to the Puritan. She has a fine hull, and if finished on the new plans will make an admirable monitor and ram.

I also recommend that the Terror, one of the finest vessels in the Navy, be rebuilt with an iron hull, which could be done in seven months.

At Boston navy-yard, the light draught monitors Shawnee and Wassuc should be repaired like the rest, at a cost of $140,000, each.

The Mahopac, at Norfolk, could be ready in a month at a cost of $1,000. She is a fine vessel since the alterations were made in her.

The monitor Amphitrite, at the Naval Academy, was originally one of the most formidable vessels in the Navy, and though deficient in steam power has a good hull and turret. She could, with an outlay of $180,000, be made a most powerful vessel.

The Dictator, at New London, also requires repairs without delay. She is one of the best vessels we have, and would make a powerful ram.

With the monitors thus repaired, we could defend our ports against any ordinary enemy, and the work I have proposed on these vessels would not be too much to undertake at one time.

RECEIVING-SHIPS.

I have examined into the condition of the receiving-ships, and find them kept in as good order by their commanding officers as circumstances will admit. Some of them, however, require a thorough overhauling and repairing to make them comfortable and efficient.

A suitable place should be provided on board for the examination of recruits, and for this reason, if for no other, the sick-bay should be placed on the gun-deck of a frigate, and the upper gun-deck of a ship of the line.

Bath-rooms should also be provided for the ablutions of recruits when they come on board. This is indispensable, as the recrits nearly always present themselves in a condition too filthy for physical examination.

The sick-bays should be enlarged, as none of them will now accommodate more than fifteen patients.

The receiving-ships are properly heated in winter, and in that respect are comfortable.

Respectfully submitted.

DAVID D. PORTER,
Admiral.

Hon. GEORGE M. ROBESON,
Secretary of the Navy.

No. 18.

REPORT TO THE PRESIDENT OF THE UNITED STATES OF THE ACTION OF THE NAVY DEPARTMENT IN THE MATTER OF THE DISASTER TO THE UNITED STATES EXPLORING EXPEDITION TOWARD THE NORTH POLE, ACCOMPANIED BY A REPORT OF THE EXAMINATION OF THE RESCUED PARTY, ETC.

SUBMITTED BY THE SECRETARY OF THE NAVY.

NAVY DEPARTMENT,
Washington, June 17, 1873.

TO THE PRESIDENT:

SIR: On receiving information of the arrival of the rescued portion of the crew of the Polaris at Saint John's, Newfoundland, I determined, in the absence of direct regular communication with that port, to send, as has been before reported to you, the United States steamer Frolic, then lying at New York, to bring them to the United States.

As it was obviously proper, in view of the prompt and responsible action which might be required, that the Government should, as soon as possible, be in possession of the fullest and most reliable information upon all the circumstances of the case, the Frolic was ordered to bring directly to Washington all the persons having personal knowledge on the subject.

On their arrival here, to the end that their knowledge might be accurately and fully elicited, judged of, and preserved, not only for the guidance of the Government but for the benefit of science and the information of the world, I associated with myself for their examination Commodore William Reynolds, the senior officer of the Navy Department, himself an old explorer; Professor Spencer F. Baird, of the Smithsonian Institution, a distinguished scientist, and member of the National Academy, who had taken great interest in the expedition, and prepared some of the scientific instruments for it; and Captain H. W. Howgate, of the Army signal service, from which corps Mr. Meyer had been detailed as meteorologist of the expedition.

In the course of the examination, which occupied six days, we have taken separately and fully, upon all the points involved upon which they had, or professed to have, knowledge, the statement and examination of each adult individual of the party who could understand or speak any English, including all of the persons rescued, excepting the wife of Hans Christian and the children.

These statements and examinations were carefully taken down in short-hand at the time, and are now, together with the diaries kept by some of the party on the ice, and a diary of the cruise of the Polaris, kept in German by Hermann Siemans, one of the seamen remaining on board, and picked up on the ice after the separation from the ship, being rapidly printed, the bulk of them already in type.

A detailed statement of the results arrived at will be found in the report signed by myself and all the gentlemen associated with me, which is herewith inclosed, and to which is annexed a copy of the last dispatch of Captain Hall, made from what is apparently the original draft, in his own handwriting, found among his personal papers, in his writing-desk, which was preserved on the ice by Esquimaux Joe, and by him delivered to me in the presence of the board. It is accompanied also by an outline-map, prepared by Mr. Meyer, giving a general outline of the geographical results.

This report is made directly to yourself, as the person under whose orders the expedition was organized, and I have myself signed it, concurring as I do in all its statements and conclusions. In some of the testimony as given will be found some statements of facts, and several strong expressions of feeling on the part of some of the witnesses against the officer remaining in command of the ship after the death of Captain Hall.

These I feel great reluctance to publish while the person referred to is absent in the discharge of dangerous and responsible duty; but I am constrained to believe that it is better for him, and will be more satisfactory to his friends, as well as to the friends of those still on board of the Polaris, that they should be published as they were given, rather than that their suppression should be made the foundation of sensational and alarming reports in no degree justified by the real facts.

It must, however, be clearly understood that in permitting this publication the Department neither makes nor declares any judgment against Mr. Buddington, who is still absent in the midst of dangers, and has had no opportunity for defense or explanation.

The facts show that though he was perhaps wanting in enthusiasm for the grand objects of the expedition, and at times grossly lax in discipline, and though he differed in judgment from others as to the possibility, safety, and propriety of taking the ship farther north, yet he is an experienced and careful navigator, and when not affected by liquor, of which there remained none on board at the time of the separation, a competent and safe commander.

I concur fully in the statements of the report as to the probable condition and situation of the ship, and the propriety of taking prompt measures for her efficient relief. Such relief can only be afforded safely and surely by means of an expedition prepared to encounter the dangers of the arctic circle, in a ship adapted for the purpose, and built and fitted to contend with large bodies of ice.

It is known that there is no such ship ready at hand in either our naval or merchant service. Indeed, it is believed that there are none such in existence except among the sealing-fleet of Newfoundland. A vessel of this fleet, sailing as they do under a foreign register, can only be used for the purpose of an expedition organized and sailing under our own flag by being purchased and put in commission by the Navy Department.

In view of all these facts, and the further and pressing consideration that any measures of relief to be effective must be taken at once, I have already begun to carry out the suggestions of the board by giving preparatory orders to the United States steamer Juniata, now at New York, to proceed, at the earliest practicable moment, to Disco, and if possible to Upernavik, for the purpose of carrying forward the necessary coal and supplies, communicating with the authorities of Greenland, obtaining information, and, if practicable, sending forward some word of en-

couragement to those on board the Polaris. This last will most likely be impossible, but we will not fail to attempt it.

I also propose to fit out at once an expedition of relief, to be sent to Northumberland Island, where the Polaris was last seen, in the Tigress, a sealing-steamer of the fleet referred to, of about 200 tons burden, built and fitted to contend with the ice, and the same ship by which the persons now here were rescued.

This ship, which is already on her way to New York, I propose, with your assent, to purchase and immediately strengthen, if necessary, and fit out for the service required.

The proposed expedition will be purely naval, experience having confirmed me in the conviction that there is little of either success or safety in any trying, dangerous, and distant expedition which is not organizedl prosecuted, and controlled under the sanctions of military discipline.

Captain Tyson, all the rescued seamen of the Polaris, and Esquimaux Joe will accompany the expedition; all of them declaring themselves ready and willing to return for the rescue of their comrades and to bring out their old ship.

The measures proposed will, of course, impose some expenditure upon the naval appropriations and responsibility upon the Navy Department. But those appropriations cannot, I think, be expended more fittingly or more in accordance with the feelings of our people, and whatever responsibility is incurred by this act of imperative public duty and national humanity I am neither authorized to evade nor unwilling to assume.

Very respectfully, your obedient servant,

GEO. M. ROBESON,
Secretary of the Navy.

WASHINGTON, D. C., *June* 16, 1873.

TO THE PRESIDENT:

The undersigned having been present at and taken part in the full and careful examination of Mr. George E. Tyson, assistant navigator; Frederick Meyer, meteorologist; J. W. C. Krüger, G. W. Linguist, Frederick Auting, Peter Johnson, Frederick Jamka, and William Lindemann, seamen; and John Herron, steward; William Jackson, cook, and Joe, Hannah, and Hans, Esquimaux, all late of the steamer Polaris; and, with the exception of the wife of Hans and five children, comprising the party which was separated from her on the ice in October last, and picked up off the coast of Labrador on April 30, of this year, by the British sealing-steamer Tigress, give the following as the result of their investigation:

The Polaris left Disco on the 17th of August, 1871, where she parted company from the Congress, arriving at Upernavik the next day. At this port she took on board some dogs, seal and dog skins, and a small quantity of coal, and shipped Hans, Hendrick, or Christian, Esquimaux, who had been with Drs. Kane and Hays, and the wife of Hans and three children. It was expected that Jensen, who had also accompanied Dr. Hays, would join the Polaris at Tessuisak.

Leaving Upernavik, the Polaris touched at Tessuisak, and there procured more dogs and a small quantity of ready-made skin clothing, but Jensen did not go with the expedition.

Leaving Tessuisak on the 24th, she proceeded northward under steam,

passing through Smith's Sound and Kennedy Channel, with very little delay or obstruction from the ice.

Near Cape Frazier Captain Hall examined the western shore in a boat to look for a safe wintering place, but was unsuccessful in finding one.

Clearing Kennedy Channel in the Polaris, Captain Hall found himself passing through a large sound in the precise position of Kane's open polar sea, with a bay on the Greenland side. In this bay the ship subsequently wintered, and it received from Captain Hall the name of Polaris Bay. Its northern cape he called Cape Lupton.

Pressing on to the northward, and passing through the sound, the ship entered another narrow channel of about twenty-five to thirty miles in width, with high land on either side, and on the 30th of August attained the highest northern latitude reached by the expedition, in latitude declared by Captain Hall to be 82° 29′ north, but afterward found by the careful calculation of Mr. Meyer to be 82° 16′ north.

At this her highest point, the Polaris was still in the new strait or channel which she had discovered, and which Captain Hall named "Robeson Straits," after the present Secretary of the Navy.

Here the ship was met by heavy floating ice extending entirely across the straits, and barring her further progress northward.

After making unsuccessful efforts to find a way through the ice, Captain Hall, in a boat, examined a small harbor on the eastern side of the straits for winter-quarters. This being found unsuitable for the purpose, was named "Repulse Harbor."

After incurring imminent risk, the ship became fairly beset in these straits, and drifted with the ice to the southward out of them to the latitude of 81° 30′ north, when the pack opening, on the 3d of September, she steamed to the eastward and found her winter-quarters in a small sheltered cove or bend of the coast, protected by a stranded iceberg, on the east side of Polaris Bay, in latitude 81° 38′ north, longitude 61° 44′ west. To this cove Captain Hall gave the name of "Thank God Harbor," calling the iceberg "Providence Berg."

At midnight on the 3d of September, 1871, Captain Hall landed with a boat on the east shore of Polaris Bay, and in the name of God and of the President of the United States raised the American flag on the land he had discovered.

On one occasion, while beset in Robeson Straits, the Polaris seemed to be in such danger of being crushed that provisions were placed upon the ice, and measures taken to be in readiness for leaving her, but she happily escaped without injury.

Immediately after securing his ship in winter-quarters, Captain Hall made preparations for a sledge journey northward, and other work was commenced by landing and setting up the observatory, getting the scientific observations under way, surveying the harbor, clearing up the ship, and making snug for the winter.

On the 10th of October Captain Hall left the Polaris, accompanied by Mr. Chester, first mate, and Esquimaux Joe and Hans, with two sledges and fourteen dogs.

Setting out on this expedition, the first step taken by Captain Hall fell upon land more northern than white man's foot had ever before touched. In the progress of the journey—unhappily the last that Captain Hall was to make toward the pole—he discovered, as appears by his dispatch, a river, a lake, and a large inlet. The latter, in latitude 81° 57′ north, he named "Newman's Bay," calling its northern point "Cape Brevoort," and the southern one "Sumner Headland."

At Cape Brevoort, in latitude 82° 2′ north, longitude 61° 20′ west, he rested, making there his sixth snow-encampment, and on October 20 wrote his last dispatch to the Secretary of the Navy, the original draft of which was found, in his own handwriting, in his writing-desk, on its examination in Washington after it was delivered to the Secretary of the Navy by Esquimaux Joe, who had kept the desk in his custody from the time it was picked up on the ice, after the separation of the rescued party from the ship.

A copy of this dispatch, so singularly preserved, accompanies this report.

Captain Hall himself deposited a transcript of it in a cairn on the side of the mountain at Cape Breevoort.

Captain Hall, it appears, had hoped, when he left the Polaris on this journey, to advance northward at least a hundred miles; but after having gone about fifty he was compelled, by the condition of the shore and of the ice and by the state of the climate, to return and await the approach of spring for another attempt. He reached the ship on the 24th of October, apparently in his usual fine health, but was attacked the same day with sickness of the stomach and vomiting; and, taking to his bed, the next day was found to be seriously ill. His most marked symptoms seem from the evidence to have been such as indicated congestion of the brain, accompanied by delirium and partial paralysis of one side. The witnesses all state that his attack was called "apoplexy," and some of them speak of their own knowledge of his paralysis and delirium. He recovered, however, after some days sufficiently to leave his bed, to move about his cabin a little, and to attempt to attend to business, but soon had a relapse, became again delirious, and died on the 8th of November, 1871. Three days afterward he was buried on the shore.

From personal examination of all the witnesses, and from their testimony as given, we reach the unanimous conclusion that the death of Captain Hall resulted naturally from disease, without fault on the part of any one.

During his illness he was under the medical care of Dr. Bessels, and as none of the persons now here are capable of giving a more particular account of the nature and symptoms of this fatal sickness, the return of the Polaris must be awaited for precise information.

All the persons examined testify to the uniform kindness and care of Captain Hall, and to the good order and efficient condition of the Polaris while under his command.

On the death of Captain Hall, Mr. Buddington succeeded to the command of the Polaris, as had been provided for in the instructions for the voyage issued by the Secretary of the Navy.

The winter was passed as is usual in the arctic regions, but without any suffering from the cold, from disease, or from the want of proper provisions.

The scientific observations were diligently kept up. Polaris and Newman's Bays were surveyed, and the coast-line to the southward of Polaris Bay was examined for over seventy miles. The crew were variously employed, and the Esquimaux hunted whenever opportunity permitted.

About the latter part of November, in a heavy gale from the northeast, the Polaris dragged her anchors, but brought up against the large iceberg before mentioned, which was aground in the bay. She was finally made fast to it, and so remained until the following summer.

During the winter she was forced, by the pressure of other ice sweeping down against her, upon the foot of Providence Berg; and being subsequently carried higher upon it by the rising of the tide and renewed

pressure from the ice, she thus remained until June, 1872. Her stem piece, resting uneasily during the whole of the stormy winter on this ice bed, was cracked, and some of her bow-planks split, causing her to leak after she again got afloat. She seems to have leaked somewhat freely at first, and the steam-pumps were worked to clear her out, but subsequently the deck-pumps, used about six minutes per hour, were found sufficient to keep her clear.

Early in June, before the Polaris was released from the ice, Captain Buddington dispatched Mr. Chester and Mr. Tyson with two boats to endeavor to get as far north as practicable. This party lost one boat, which was crushed in the ice almost at the commencement of their journey; the loss was, however, supplied from the Polaris by the canvas boat, and with much difficulty and delay they got as far north as Newman's Bay. They there waited the possible opening of the ice until the middle of July, when written orders from Captain Buddington directed their return to the ship. They were unable to transport the boats, and, leaving them on the shore, they started on foot, and arrived on board after an absence of about six weeks.

While they were away, and some time in June, the Polaris had broken out of her winter-quarters, and had made several attempts to proceed northward to pick up the party with the boats, but the ice was found to be impassable, and Captain Buddington, on receiving the party on board, determined to make the best of his way southward to the United States as soon as the ice would permit. They started southward August 12, 1872, and slowly made their way along the western shore until the next day, when the ship, having got further in mid-channel, was badly beset by the ice in latitude about 80° 40′ north, and was in danger of wreck for some hours, when she was freed again.

Early on the morning of the 12th, the day of starting southward, the family of Hans Christian was increased by the birth of a son, who was christened Charles Polaris, and who made one of the party afterward left on the ice-floe.

On the 16th of August the ship was made fast to a large floe of ice in the latitude of 80° 2′ north, and longitude about 68° west, and while still fast to this floe drifted south through Smith's Sound nearly to Northumberland Island.

In pursuance of the usual orders under similar circumstances, a quantity of provisions and some fuel had been placed on the deck of the steamer, in readiness to be removed to the ice should the safety of the ship become endangered; and it was ordered and understood that, if a crisis should be imminent, not only these stores, but clothing, papers-records, instruments, guns, ammunition, &c., were also to be put upon the floe, in order to preserve the lives of the party and the results of the expedition should it become necessary to abandon the ship and to take refuge on the ice. A canvas hut had also been erected upon the floe for shelter should the ship be lost.

On the night of the 15th of October, 1872, in about latitude 79° 35′ north, during a violent gale of wind and snow, the need for such preparation became apparent, as the ship was suddenly beset by a tremendous pressure of ice, which was driven against her from the southward and forced under her, pressing her up out of the water, and by successive and violent shocks finally throwing her over on her beam-ends.

Captain Buddington directed the provisions, stores, and materials in readiness, as before described, to be thrown overboard on the ice, and ordered half the crew upon the ice to carry them upon a thicker part to the hummocks, where they would be comparatively safe. He also sent all the Esquimaux, with their kyaks, out of the ship, and lowered the

two remaining boats upon the floe. While so engaged, in the darkness of an arctic night, in the midst of a fierce gale and driving snow-storm, the hawsers of the Polaris failed to hold her, and she broke adrift from the floe, and in a few minutes was out of sight of the party who were at that moment busily at work on the ice.

It is the uniform opinion of the witnesses, and our unanimous conclusion from their testimony and from the circumstances detailed, that this separation of the ship from the men, women, and children upon the ice floe was purely accidental.

After losing sight of the ship, some of the men and a large part of the provisions were found to be afloat on a separate piece of ice. The men were rescued by means of the boats, which fortunately had been saved on the ice, and the party thus collected on the main floe passed the night as well as they could.

The next day they made several attempts to reach the land with the boats, but failed, notwithstanding their most persistent efforts, owing to the obstruction of the ice and the violence of the wind.

While thus striving to get on shore, but at what particular time of the day is not exactly ascertained, the Polaris came in sight to the northward, apparently coming toward the floe, under steam and sails. An India-rubber blanket was hoisted on an oar and displayed from the top of a hummock; the colors were set, and other signals were made to attract the attention of the Polaris, and as she approached so near to them that they plainly saw her down to her rail, and could distinguish her escape-pipe, and kept on toward them until they supposed her to be not more than four miles off, they felt sure she could force her way through the ice to their position, and that in a little while they would be again on board. In this they were disappointed; the Polaris altered her course and disappeared behind the shore.

Some time afterward, as the floe drifted away, she was again seen by some of the men under the land, with her sails furled, and apparently at anchor, or made fast to the shore or the ice.

It is most likely that the party on the ice was seen from the Polaris. The hut erected on the floe, the ship's boats, the colors, the elevated signal blanket, and the group of nineteen persons standing in relief against a white background could scarcely have remained unnoticed.

It was natural that, under the circumstances, the party on the ice should have felt deeply disappointed at the failure of the ship to come to their relief, and should, at the time, have ascribed it to overcaution, if not indifference, rather than inability on the part of her responsible commander; neither is it unnatural that this feeling, fostered during the weary watches of their long winter upon the ice, should still remain to affect in a greater or less degree their present judgment on the subject; but it must not be forgotten that they, like ourselves, were and are without full information of the actual condition of the Polaris at the time spoken of, and cannot know how far the real dangers of their position were understood and appreciated by those on board of her. Such information and knowledge are absolutely necessary to a correct judgment, and must not be assumed as the foundation of censure against persons acting under circumstances so trying and uncertain, who, by reason of their enforced absence, have no opportunity for explanation. Considering the subject dispassionately, and remembering that the Polaris had been so roughly handled by the ice the night before that both captain and crew thought she would be lost, and attempted the removal of her provisions and materials to the floe; that when she broke adrift and was swept off by the gale, her steam-pipes, valves, and con-

nections were frozen solid, and that she was for hours without steam, unmanageable amid the floating ice; that she was still leaking from her broken stem, and had probably received other injuries after she went adrift; and that she was left without a single boat of any kind, it seems most likely that her actual condition was such as to impose upon her commander the duty of getting her, with the lives and property which remained under his charge, at once into a position of safety under the shelter of Northumberland Island, where she was last seen by the party on the floe. If such were the state of the case, the first duty of Captain Buddington, under such circumstances, was to look to his vessel, particularly as he probably believed that the party on the ice could, by the aid of the two boats, the kyaks, and the scow in their possession, find their way back to the Polaris quite as easily as he could force his way to them.

But whatever might have been his opinion or theirs, the elements quickly determined the question. Shortly after the Polaris had been sighted for the second time a violent gale from the northeast sprung up, the weather became thick, the ship and the land were lost sight of, and the ice floe drifted away to the southward, with these nineteen persons still upon it.

In view of the circumstances detailed, it is therefore our unanimous judgment that this final separation from the ship was also accidental.

From October 15, 1872, until April 1, 1873, when they were picked up in latitude about 59° north, these nineteen men, women, and children remained through the whole of the dark and dreary winter upon the ice. In their first endeavors to reach the land, they occupied for a time different pieces of floating ice, but, forced finally to abandon all hope in this direction, they rested at last upon the floe upon which the Polaris had made fast August 15, 1872, in latitude 80° 2′, and from which she broke adrift on the night of October 15 following.

The original extent of this floe they estimated at about five miles in circumference. Snow huts were built by the Esquimaux, in which they lived and kept their provisions. Of this they had saved a fair supply, which they apportioned and divided by means of weights made from shot, with rude scales devised by Mr. Meyer. Occasionally during the winter the Esquimaux shot a seal, and once they killed a bear, and thus renewed their supply of meat.

On the 1st of April, finding their icy quarters much reduced by the breaking up of the floe, and that the current was then setting them to the southeast and out to sea, they launched their boat into open water and pulled toward the west, in order, if possible, to gain the coast. At times meeting ice too closely packed to get through, they were compelled to haul the boat upon it, launching her again as soon as a lead opened to the westward or southward. In this way they passed a month of weary and desperate endeavor.

Toward the close of April their provisions were almost exhausted, and they were one day absolutely reduced to less than a biscuit apiece and a mouthful of pemmican, when a bear, scenting them on the ice, approached them and was shot, and they were thus rescued from starvation.

Revived by this good fortune, and strengthened by their new supply of fresh meat, they struggled on till the last day of April, 1873, when they were rescued by the Tigress. At this time they had the coast of Labrador in sight, distant about forty miles, and were hoping to reach it before their provisions were exhausted.

The circumstances of this most extraordinary voyage are given at

length by the witnesses, and are particularly detailed in the diaries that some of the rescued party made day by day upon the ice, and which are copied in the testimony.

After their rescue, although enfeebled by scanty diet and long exposure, and mentally depressed by their isolated and unhappy situation, so fearfully prolonged and of such uncertain issue, the general health of these hardy voyagers remained good, and when their trials and anxieties were ended they soon regained their usual strength.

At the time of their separation from the Polaris every one belonging to the expedition was in good health. Nineteen were upon the ice floe, and they believe that all the rest were safe and on board the ship. The Polaris had not then repaired her broken stem, and still leaked somewhat, but was easily freed by the deck-pumps. She had plenty of provisions, but not much coal—probably about enough to last through the winter. She was last seen, apparently at anchor, under Northumberland Island, where it is most likely she remained for winter-quarters. Dr. Hays found Esquimaux residing on that island, and the Esquimaux settlement at Notlik is close by. Communication with these people would be easily opened and maintained, and no apprehension for the Polaris, or, in the absence of accident or sickness, for those on board, is entertained by any of the rescued persons.

As to the question whether the ship can make her way to the Danish settlements at Upernavik or Disco without steam, if she gets free from the ice this season, supposing her to be in as good condition as when the rescued party was last on board, the witnesses differ in judgment; but the safer if not the better opinion is that she will need assistance to bring her completely and safely out.

Northumberland Island is in latitude 77° 35′ north. A well-found ship, with average good fortune, would be able to reach that island in the summer, and to return in the autumn. It is possible that the Polaris may be able to return without assistance; but as she remains within the arctic circle, not sound in her hull, with little fuel, and with many precious lives on board, and with the records and collections of her cruise in their possession, we are unanimously of the opinion that this possibility should not be assumed, and that a suitable vessel should, as soon as possible, be procured and sent in search of her, to render her return as certain and speedy as may be. While a suitable ship, constructed and fitted for voyages among the ice, is getting ready, we believe it would be well to dispatch such naval vessel as may be available, to carry forward proper supplies of coal and provisions for the relief of the expedition, to inform the authorities of Greenland of the condition of affairs, to gather all possible information from them and from the Esquimaux of the coast, and, if possible, by means of the latter to send some intimations of speedy relief to the officers and crew of the ice-bound ship.

From the testimony it appears that every possible opportunity was embraced by the members of the scientific corps of the expedition to carry out the instructions given, the only direction in which there seems to have been a partial failure being in reference to the use of the photographic apparatus and the dredge. This, however, was due to the absence of suitable opportunities, or to some insurmountable impediment at the time. While the records of the astronomical, meteorological, magnetic, tidal, and other physical departments of the exploration appear to have been extremely full, and the observations in each appear to have been conducted according to approved methods, the collections of natural history are shown to have been not less extensive,

the store-rooms of the Polaris being filled with skins and skeletons of musk-oxen, bears, and other mammals; different species of birds and their eggs; numerous marine invertebrata; plants, both recent and fossil, minerals, &c. Not the least interesting of these collections are specimens of driftwood picked up on or near the shores of Newman's and Polaris Bays, among which Mr. Meyer thought he recognized distinctly the walnut, the ash, and the pine. Among the numerous facts that appear to be shown by the testimony elicited on the examination, we may mention as one of much interest that the deviation of the needle amounted to 96°, being less than at Port Foulke and Rensselaer Harbor, as given by Dr. Kane and Dr. Hays. Auroras were frequent, but by no means brilliant, generally quite light, and consisting sometimes of one arch and sometimes of several. Streamers were quite rare. Only in one instance (in February, 1872) did the aurora appear of a distinct, rosy red. This was foreboded in the morning, from 8 to 10 o'clock, by a very decided disturbance of the magnetic needle. Shooting-stars were so constantly seen that, although no special shower was observed, it was scarcely possible ever to look at the star-lit sky without noticing them in one direction or another. The rise and fall of the tides were carefully observed, the average being about five and a half feet. The greatest depth of water noticed was about one hundred fathoms. The existence of a constant current southward was noted by the expedition, its rapidity varying with the season and locality. The winter temperature was found to be much milder than was expected, the minimum being 58° below zero in January, although March proved to be the coldest month.

The prevailing winds were from the northeast, although there were occasionally violent tempests from the southwest. Light winds were noticed, however, from all points of the compass. Rain was occasionally observed, only on the land, however, the precipitation presenting itself over the ice in the form of snow. During the summer the entire extent of both low lands and elevations are bare of both snow and ice, excepting patches here and there in the shade of the rocks. The soil, during this period, was covered with a more or less dense vegetation of moss, with which several arctic plants were interspersed, some of them of considerable beauty, but entirely without scent, and many small willows scarcely reaching the dignity of shrubs. The rocks noticed were of a schistose or slaty nature, and in some instances contained fossil plants, specimens of which were collected. Distinct evidence of former glaciers were seen in localities now bare of ice, these indications consisting in the occurrence of terminal and lateral moraines.

Animal life was found to abound, musk-oxen being shot at intervals throughout the winter, their food consisting of the moss and other vegetation obtained during this season by scraping off the snow with their hoofs.

Wolves, also bears, foxes, lemmings, and other mammals, were repeatedly observed. Geese, ducks, and other water-fowls, including plover and other wading-birds, abounded during the summer, although the species of land-birds were comparatively few, including, however, as might have been expected, large numbers of ptarmigan or snow-partridge. No mention is made by the rescued party of the occurrence of hawks and owls. No fish were seen, although the net and line were frequently called into play in the attempt to obtain them. The waters, however, were found filled to an extraordinary degree with marine invertebrata, including jelly-fish and shrimps. It was believed by the party that the seals depend upon the latter for their principal subsist-

ence, the seals themselves being very abundant. Numerous insects were observed, also, especially several species of butterflies, specimens of which were collected; also, flies and bees and insects of like character.

The geographical results of the expedition, so far as they can now be ascertained from the testimony of Messrs. Tyson, Meyer, and their comrades, may be summed up briefly as follows:

The open polar sea laid down by Kane and Hays is found to be in reality a sound of considerable extent, formed by the somewhat abrupt expansion of Kennedy's Channel to the northward, and broken by Lady Franklin's Bay on the west, and on the east by a large inlet or fiord, twenty-two miles wide at the opening, and certainly extending far inland to the southeast. Its length was not ascertained, and Mr. Meyer thinks that it may be, in fact, a strait extending till it communicates with the Francis Joseph Sound of the Germania and Hansa expedition, and with it defining the northern limits of Greenland. This inlet was called the Southern Fiord. North of it, on the same side, is the indentation of the shore called Polaris Bay by Captain Hall, where the Polaris wintered in latitude 81° 38′ north. The northern point of this bay was named Cape Lupton. Its southern point is yet without a name.

From Cape Lupton the land trends to the northeast, and forms the eastern shore of a new channel from twenty-five to thirty miles wide, opening out of the sound above mentioned, to which Captain Hall, as has already been stated, gave the name of Robeson Straits. The western shore of these straits, north of Grinnell's Land, is also nameless. Northeast of Cape Lupton, in latitude 81° 57′, is a deep inlet, which Captain Hall called Newman's Bay, naming its northern point Cape Brevoort, and its southern bluff Sumner Headland. From Cape Brevoort the northeast trend of the land continues to Repulse Harbor, in latitude 82° 9′ north—the highest northern position reached by land during this expedition.

From an elevation of 1,700 feet at Repulse Harbor, on the east coast of Robeson Strait, the land continues northeast to the end of those straits, and thence east and southeast till lost in the distance, its vanishing point bearing south of east from the place of observation.

No other land was visible to the northeast, but land was seen on the west coast, extending northward as far as the eye could reach, and apparently terminating in a headland and near latitude 84° north.

Mr. Meyer also states that directly to the north he observed, on a bright day, from the elevation mentioned, a line of light apparently circular in form, which was thought by other observers to be land, but which he supposed to indicate open water.

Besides ascertaining accurately the condition and extent of what was before supposed to be an open polar sea, discovering the southern fiord to the southeast and Robeson's Straits to the north, with another wide expanse of water beyond it, and extending, by examination and survey, the coast-line on the east up to latitude 82° 9′ north, and by observation somewhat further, prolonging the west coast to the northward, and reaching with the Polaris, under steam, the high latitude of 82° 16′ north—a point far beyond the limits of all previous navigation toward the pole—errors in the shore-line of the west coast, as laid down by Dr. Hays, and also errors in the shore-line of Greenland, as laid down by Dr. Kane, were observed and corrected.

Of course the full scientific results of the Polaris expedition cannot be known until that vessel shall have been found and brought back with the treasures she has gathered, and the records and details of her

arctic explorations. But enough is told by the witnesses whom we have examined to excite expectation and encourage the hope of large and valuable additions to the domain of human knowledge.

GEO. M. ROBESON,
Secretary of Navy.

SPENCER F. BAIRD,
Assistant Secretary Smithsonian Institution.

WM. REYNOLDS,
Commodore United States Navy.

H. W. HOWGATE,
Acting Signal-Officer, United States Army.

Copy of draft of Captain Hall's dispatch.

SIXTH SNOW-HOUSE ENCAMPMENT, CAPE BREVOORT,
NORTH SIDE ENTRANCE TO NEWMAN'S BAY,
(latitude 82° 3′ *north, longitude* 61° 20′ *west,)*
October 20, 1871.

TO THE HONORABLE SECRETARY OF THE UNITED STATES NAVY,
GEORGE M. ROBESON:

Myself and party, consisting of Mr. Chester, first mate, my Esquimaux Joe, and Greenland Esquimaux Hans, left the ship in winter-quarters, Thank God Harbor, latitude 81° 38′ north, longitude 61° 44′ west, at meridian of October 10, on a journey by two sledges, drawn by fourteen dogs, to discover, if possible, a feasible route inland for my sledge journey next spring to reach the north pole, purposing to adopt such a route, if found, better than a route over the old floes and hummocks of the strait, which I have denominated Robeson Strait, after the honorable Secretary of the United States Navy.

We arrived on the evening of October 17, having discovered a lake and a river on our way; the latter, our route, a most serpentine one, which led us on to this bay fifteen minutes distant from here, southward and eastward. From the top of an iceberg, near the mouth of said river, we could see that this bay, which I have named after Rev. Dr. Newman, extended to the highland eastward and southward of that position about fifteen miles, making the extent of Newman's Bay, from its headland or cape, full thirty miles.

The south cape is a high, bold, and noble headland. I have named it Sumner Headland, after Hon. Charles Sumner, the orator and United States Senator; and the north cape, Brevoort Cape, after J. Carson Brevoort, a strong friend to arctic discoveries.

On arriving here we found the mouth of Newman's Bay open water, having numerous seals in it, bobbing up their heads; this open water making close both to Sumner Headland and Cape Brevoort, and the ice of Robeson Strait on the move, thus debarring all possible chance of extending our journey on the ice up the strait.

The mountainous land (none other about here) will not admit of our journeying further north, and as the time of our expected absence was understood to be for two weeks, we commence our return to-morrow morning. To-day we are storm-bound to this our sixth encampment.

From Cape Brevoort we can see land extending on the west side of the strait to the north 22° west, and distant about seventy miles, thus making land we discover as far as latitude 83° 5′ north.

There is appearance of land further north, and extending more easterly than what I have just noted, but a peculiar dark nimbus cloud that constantly hangs over what seems may be land prevents my making a full determination.

On August 30, the Polaris made her greatest northing, latitude 82° 29′ north; but after several attempts to get her further north she became beset, when we were drifted down to about latitude 81° 30′. When an opening occurred we steamed out of the pack and made harbor September 3, where the Polaris is. [Corner of the manuscript here burned off.]

Up to the time I and my party left the ship all have been well, and continue with high hopes of accomplishing our great mission.

We find this a much warmer country than we expected. From Cape Alexander the mountains on either side of the Kennedy Channel and Robeson Strait we found entirely bare of snow and ice, with the exception of a glacier that we saw covering about latitude 80° 30′ east side the strait, and extending east-northeast direction as far as can be seen from the mountains by Polaris Bay.

We have found that the country abounds with life, and seals, game, geese, ducks, musk-cattle, rabbits, wolves, foxes, bears, partridges, lemmings, &c. Our sealers have shot two seals in the open water while at this encampment. Our long arctic night commenced October 13, having seen only the upper limb of the sun above the glacier at meridian October 12. This dispatch to the Secretary of the Navy I finished this moment, 8.23 p. m., having written it in ink in our snow-hut, the thermometer outside minus 7°. Yesterday all day the thermometer minus 20 to 23°; that is, 20° minus to 23° minus Fahrenheit.

Copy of dispatch placed in pillar, Brevoort Cape, October 21, 1871.

Examination conducted at Washington, D. C., of the party separated on the ice from the United States Steamer Polaris expedition toward the north pole, and picked up on the coast of Labrador and brought to the United States; with diaries of several members of the expedition.

WASHINGTON, D. C., *June* 5, 1873.

This afternoon, at 4 o'clock, Hon. GEO. M. ROBESON, Secretary of the Navy, accompanied by Admiral GOLDSBOROUGH, Commodore REYNOLDS, Prof. S. F. BAIRD, and Captain HOWGATE, of the signal-service, assembled at the navy-yard, for the purpose of taking the statements ot Captain Tyson and other members of the rescued party from the steamer Polaris, brought from Saint John's in the Frolic, Commander C. M. Schoonmaker. Commander Schoonmaker reported to the Secretary of the Navy that he arrived at the navy-yard at a quarter past one o'clock to-day; that he left Saint John's on the morning of the 28th of May, at 4 o'clock.

He said, in response to inquiry by the Secretary:

We had a pleasant voyage, except that we encountered a gale after leaving St. John's; the wind was southwest, and we were where we expected to see ice, so that we had to slow down, as the ship is not suited to combat ice.

The SECRETARY. You have sent your report to the Department?

Commander SCHOONMAKER. Yes, sir. I gave it to Admiral Goldsborough. I found these people in charge of the consulat Saint John's. I received them on the 27th of May. I had no trouble with any of them. They are all well-behaved, orderly people; and all seem to be good men. Captain Tyson seems to be very intelligent; I have seen him more

than any of the rest; I have had him with me in the cabin. He has made a very favorable impression on me. The list of the men on board the Frolic is in the hands of Admiral Goldsborough.

Examination of Captain Tyson.

The SECRETARY said: Captain Tyson, I desire your statement about this voyage—all that you know about it, and all that happened to you on the ice; your own statement, made in your own way, individually and separately, not mixed up or colored with any outside suggestions; and for that reason I have sent for you first, as the chief person of the expedition, among those who are here. You are aware, perhaps, that this subject has attracted a great deal of attention, and that there is a good deal of interest in the expedition, and in the persons who composed it, on the part of the Government and the public generally. It is proper, therefore, that an investigation should be had, which will develop all the facts as they occurred; that the Government may be rightly informed, in view of future action, and all parties satisfied.

I will ask you a few questions by way of opening your statement, but I prefer to have you give a regular detailed account in your own way.

Question. Your name?

Answer. Geo. E. Tyson.

Question. Your home?

Answer. Brooklyn, New York.

Question. Your age, and business?

Answer. Forty-four, last December. I have lived in New London since 1853. I have been a whaleman; have been a master on several cruises; of the brig Georgiana, of the bark Orra Taft; the bark Antelope; and schooner Erie, two voyages. I have made five whaling voyages as master. I have been in the whaling business since I was twenty-one. These vessels have been to Cumberland Sound, Davis Straits, and the Greenland Seas generally. Before I was on this expedition on the Polaris, I had been as far north as 74° 30′, I think.

I was never very familiar with Baffin's Bay, but with the waters to the south of that I was quite familiar. The point to which I sailed in my first voyage was called the Devil's Thumb, in Melville Bay. It is in latitude 74° 30′. I knew Captain Hall before this expedition. I became acquainted with him in 1860, I think. He came to New London to inquire about the north, and there he called to see me. That was before his first voyage. I have known him ever since. I have not had a great deal of intercourse, but I saw him in Hudson's Bay and in Repulse Bay, and supplied him with provisions, in 1865, I think. That was when I was in command of the Antelope. I supplied him with provisions and a boat. He was then up at Wager Bay, at a place called Rouse's Welcome, (on the map, Ross's Welcome.) He was then there, living on shore with the Esquimaux. I saw him again on my next voyage. I came up Hudson's Straits and went up Cumberland Gulf or Cumberland Inlet, and wintered there, in 1867 or 1868, I think. I find it difficult to be accurate in regard to dates, and am not certain. I was then in the topsail schooner Erie. I went up into Repulse Bay, and there I saw Captain Hall again. I went from New London to Repulse Bay, in Hudson's Bay, that is, at the head of navigation. Captain Hall was brought out in the Ansel Gibbs, two years after I saw him there, I think; it must have been 1870 when he came home. We were always friendly, but I did not see him again until the fall of 1870, after

my second voyage in the schooner Erie. He was then in Groton, Connecticut, and he came to see me in New London, as soon as I arrived.

Question. For what purpose?

Answer. He came to me to go as sailing-master of the Polaris. The place was afterward occupied by Captain Buddington.

Question. Why did not you agree to go?

Answer. I had another voyage in view then, that I thought of engaging in, and I refused to go. He called to see me three times. This was in the fall of 1870, in November or December. I told him I could not give a decided answer until spring. Shortly after my refusal I heard that he had engaged Captain Buddington. I did not see him again, or have any communication with him, until I met him in Brooklyn in the summer of 1871. I was then living in Brooklyn; called to see him at the navy-yard. He then proposed my going again. I had not succeeded in starting the voyage that I expected to, and I told him I would go. I sailed in the vessel. I sailed from Brooklyn on the Polaris in no capacity whatever. My understanding with Captain Hall was that I should accompany him to the pole, or on his journey to the pole, should he make one. I went in the Polaris, and my appointment as assistant navigator of the ship followed me in the Congress, and I received it at Disco.

Question. You knew Captain Buddington?

Answer. I was acquainted with him slightly. He lives in Groton, Connecticut, just across the river from New London. My first acquaintance was in 1850; it was on my first voyage at sea. He was mate of the vessel. Since then I had known him by reputation only. I had no particular communication with him. We sailed from New London in the Polaris on the 3d day of July, 1871, I believe. We arrived at St. John's about the 11th, and sailed from there on the 18th of July. We went to Fiskanaes, on the coast of Greenland. Captain Hall was in hopes of finding Hans Christian or Hans Hendrick there. It is on the south coast of Greenland, in latitude 63°, I believe. We went from there to Holsteinberg, and from there to Disco. It was supposed at the time that the Congress might touch at Holsteinberg. We stopped there only a short time, perhaps forty-eight hours. We coaled at Disco, and carried in all the provisions it was possible to carry. We sailed from there on the 19th day of August, I think. From there we went to Upernavick. Stopping there a short time, and taking Governor Elburg on board, we went on to Kingituk, where he tried to get some dogs. On our arrival at Upernavik, Captain Hall sent out for Hans. He got some dogs at Kingituk, I do not know how many; some half a dozen, perhaps. It was hard work to get them. He went from Kingituk to Tessuisak, not Tessuisak Hut, which is still farther north. There he bought some dogs, and endeavored to procure the services of Jansen, but for some cause or other he could not do it. We sailed from there on the 24th of August, I think, and went right directly north, making Cape York. Cape York is above Tessuisak, across the bay, in about 76° north latitude. We then proceeded up the coast to Cape Alexander, passing inside of Cumberland Island. Cape Alexander is in latitude 78°, I think.

Question. Did you keep a diary?

Answer. I commenced one after we got into winter-quarters; not before. I had no time and no place to do any writing. I had no place afterward, in fact. We went along up the coast till we passed just above Rensselaer Harbor, in latitude about 78° 40′. There we struck across toward Cape Isabella, following the ice along, and brought in somewhere near Cape Prescott. There was a solid barrier of ice along across Smith's Sound, and they were inclined to turn back and go into

Port Foulke, but we discovered a passage close into the land, and we went along on the west side of Smith's Sound, somewhere off Cape Hawks. We discovered a passage toward the land. It was pash ice. They called it solid, but it was pash. We followed the land in close, passing Carl Ritter Bay, as it is laid down on the chart, but these points are all wrong on the chart, and then we stood across Kennedy's Channel. From about Cape George Back, about latitude 81°, we stood across, the ice leading us off toward the northeast, across Kennedy's Channel. At this time I spent most of my time aloft. We followed the ice from Cape Back across, and then over to Cape Lieber, and were brought up in a fog about fifteen miles off the land. I think this was about the 28th of August, in latitude 81° 35′. After we were laid up a little while, we proceeded farther to the northeast again, following the shore closely. Kennedy's Channel here is not more than fourteen miles wide, in the neighborhood of Cape Constitution. Then we went still farther north, up into what is now called "Robeson's Channel." This channel commences beyond what was formerly known as Kane's Open Sea, but is now called "Polaris Bay." Kennedy's Channel opens into a bay, similar to Smith's Sound, toward the northeast. The open Polar Sea, instead of being a sea, is nothing but this bay. We came up into what was known as Kane's Open Polar Sea, and we discovered it to be a bay at the head of Kennedy's Channel. The land on the east side tends easterly; the bay lies to the eastward of the channel. This Captain Hall named Polaris Bay. It is the same place that was seen by Morton, and formerly called Kane's Open Polar Sea. We crossed that bay. When off Cape Lieber we are in that bay. Kane thought he saw a sea, but there is nothing but a bay there. It is about forty-five miles wide; the land is plain to be seen at all times when you get high enough; the land is high. We crossed that bay, and went nearly through another channel, similar to Kennedy's Channel. It is about seventeen or eighteen miles wide. That is Robeson's Channel, or Robeson Straits. It was obstructed by heavy ice. We went nearly through it. This is the highest water ever sailed in. We went to latitude 82° 16′. Captain Hall called it 82° 28′, but the scientific folks in the winter called it 82° 16′. That was after they had corrected the calculation.

Question. Did you force your way any farther?

Answer. No, sir; there was no forcing of the way. We kept under the eastern shore. It was pretty foggy, and when we got pretty well through, I could see open water beyond, and the land lying as far to the north as I could see; on the eastern side, I suppose it is a bay; I imagined several times I could see land on both sides. That is one thing that makes me think it is a bay; and the running of the ice is another reason. I was at the mast-head a great deal of the time. The working of the ice through the winter, too, led me to think there was a large and extensive bay beyond. Here we got beset with ice in Robeson's Channel, and were there several days, and Captain Hall landed provisions on the ice one day.

Question. Why did he land the provisions?

Answer. For fear the vessel might be crushed; and he wished something on the ice to stand the party through the winter. We took it aboard again the next day. We were drifting southwest, and the wind was blowing northeast. We drifted out of Robeson's Channel back again, and Captain Hall steamed in under the land, and came to anchor behind some bergs. The wind and current drifted us; we could not steam nor sail while in the ice. The wind blew a gale from the northeast that took us out. After opening into Polaris Bay, the chan-

nel widens, giving a chance of escape. We steamed in under the land and went into winter quarters, and staid there. I think it was the 2d day of September, 1871; I am not sure to a day. There is no other protection to a ship there than icebergs and heavy ice thus grounded, and Captain Hall anchored his ship under the protection of this berg and other grounded pieces. The next morning he called the mate, Mr. Chester, and myself, to consult, to see whether we should proceed north or not. Our decision was to go north, but it was overruled by Captain Buddington.

Question. How?

Answer. By his influence over Captain Hall.

Question. Who were present at the consultation?

Answer. Captain Hall, Captain Buddington, Mr. Chester, and myself. Buddington was opposed to going north.

Question. What reason did he give?

Answer. He said we would never get back again; we had no business to go.

Question. Captain Hall sent for you and the mate?

Answer. Yes, sir; in the cabin. Hall and Buddington were there when Chester and I went, and the consultation was with us four. Chester and I were for going north; Buddington, for staying.

Question. Did he mean to consult you about going north at that time—in September?

Answer. He asked what it was best to do; should we go farther north? Our decision was, yes, farther north. The northeast wind had opened the channel, and we could go. Captain Buddington, with an oath, said he would be damned if she should move from there. He walked off, and Captain Hall followed him, and they had some conversation together. A few hours before they had been thinking of landing some provisions; and Captain Hall then came to where we stood, and ordered us then to land the provisions. Of course we said nothing more.

Question. Then you considered that that conversation decided the fact that the ship should then and there be laid up for the winter?

Answer. Yes, sir.

Question. The channel was then open to the northeast?

Answer. Yes, sir; as far as I could see.

Question. What did Captain Hall say about going north?

Answer. He spoke to me in the afternoon; and I said I should receive no credit, but it would be a great credit to him to go two or three degrees farther.

Question. When consulting, did he express his own opinion?

Answer. No, sir.

Question. Did you land all the stores and supplies?

Answer. O, no, sir; only a portion; just enough so that in case the vessel should drift the party might live.

Question. Did you deck over the ship?

Answer. We housed her with canvas, and we staid there during the entire winter, until June. I was away from the ship when she broke out; I do not know what day she broke out. We went into winter-quarters, I think, on the 2d of September. Then we had a snow-storm, and the ice formed inside of the bergs and hummocks, but it was open outside. The ice was weak for a long time, and then it hardened up so that we could walk upon it. We lived on the ship entirely. We did very little. We read and wrote, but it was soon dark. The sun disappeared on the 17th day of October, and re-appeared on

the 28th of February. There were one hundred and thirty-five days' absence of the sun. After we had become settled in winter-quarters, Mr. Chester, Dr. Bessels, and the two natives went off hunting, and were gone two days. The two Esquimaux, Joe and Hans, went with them. On their return, Captain Hall prepared to go on an expedition himself—a sledge expedition. This was in October. He started on the 10th of October; Mr. Chester went with him, and the two natives, Chester and Hans, on one sled, and Captain Hall and Joe on another. We could distinguish day from night then; we had several hours of light—about eight hours on the 10th of October; no sun, but twilight; quite light enough to see to work. They got off about one o'clock in the day, and they returned a little after one o'clock on the 24th of October; were gone just two weeks. I saw Captain Hall off when he went; helped him off. He went across the plains to the eastward. We lay in front of quite a large plain, and there were high mountains on each side of it. He started to the eastward. Polaris Bay is in latitude 81° 38′, longitude 61° 44′ west. He went off in about an east-northwest direction, across the plain. I saw him when he came back; I met him on the shore. He went to 82°—not as far as we had been with the ship—to what we called Newman's Bay, a bay on the east side of Robeson Channel. I talked with him when he came back; I had a few words when he was on the shore. He said he was never better in his life; he enjoyed his sledge journey amazingly, and was going right off on another journey, and wished me to go with him. He did not tell me anything about the particulars of his journey. I was at work outside, banking up the ship, putting a banking of snow-blocks up about ten feet thick, to keep away the cold and frost. I had been at work at it several days when Captain Hall returned, and as soon as he went on board I resumed my work. It soon after came on dark, and I went on board. I heard he was sick about an hour after his arrival; I cannot tell who told me. I went into the cabin, and he was lying in his berth. He said he felt sick at his stomach. I asked if he did not think an emetic would do him good. I said, if he was bilious, I thought an emetic would do good. He said he thought he was bilious. He grew rapidly worse, and soon became delirious. I do not think it was 24 hours before he became delirious. He did not say anything about his symptoms excepting that he felt sick at his stomach; that was all the remark he made to me. Then he grew delirious. Mr. Chester and Mr. Morton watched with him. At times Captain Hall would call me, and I would sit and talk with him for a time. He was delirious.

Question. Did he ever talk very rationally after he was taken ill?

Answer. I think about the 3d of November, after he had been sick seven or eight days, he got better; he talked rationally, and went to writing about his business. But he still appeared to be thinking on one subject; he thought some one was going to injure him; he was very suspicious; he seemed to think somebody was going to poison him. In his first delirium he accused about everybody; but when he was up and appeared rational, he did not say anything to me about it, but he was very particular what he took.

Question. Did he choose who should watch with him?

Answer. No, sir; he did not choose any one; they watched voluntarily. I was at work outside, and did not know what was going on in the ship except when I came on board. At times he would insist on my coming there, and I went.

Question. Did he accuse any one when you were by?

Answer. Yes, sir, almost everybody; and when I was absent he might

accuse me for aught I know. He accused Captain Buddington and the doctor of trying to do him an injury.

Question. Whom else did you hear him accuse?

Answer. I believe he accused about everybody, in his delirium. I do not know them; but in his ravings he would let out against almost everybody. He got better, I think, the second or third day of November, and he went around, attending to his business; and I was in the cabin and talked with him. He did not accuse anybody then; and he again proposed his sledge journey; said he intended to go, and wished me to go with him. I think it was not more than twenty-four hours after that, when he was sick again. He was up two or three days, writing, attending to his business, as I thought. But he was very careful as to what he ate and drank. He had a clerk there, Mauch; he had taken him from being a fireman and made a clerk of him. I believe he would make him taste all the food, or wine, or medicine, that he took.

Question. Was he taken again with the same symptoms as at first?

Answer. He retired in the evening; Mr. Chester was with him; and Mr. Chester said Captain Hall was recovering rapidly and felt first-rate, and would be around in a few days. During the night he grew worse, and died that night. I got the information first from Captain Buddington, who came to my room, and told me the captain was dying. I got up and went to the cabin, and looked at him. He was insensible—knew nothing. He lay upon his face in his berth, breathing very heavy. I could not see his face. His face appeared to be buried in his pillow, and he was breathing heavy, and so he died. He never said a word; had no sane moments before his death.

Before his death there had been some little difficulty between Captain Buddington and himself. It was before he started on his journey. Captain Hall was about suspending Captain Buddington from duty, but he passed it over. The difficulty was his foul language about the ship, and his taking anything he could lay his hands on—the provisions or liquors about the ship. Captain Hall said he was going to put him off duty, and asked me what I thought of it. I objected to it. I thought it would be breaking up the ship's company at that early stage. As Captain Hall had proposed to me to go beforehand, in the same capacity as Captain Buddington, I felt I could not say anything. I told him to give him a good talking to, and perhaps the man would do better. On the strength of that he passed it over, and went on his sledge journey, and returned, and died.

Question. Had there been any difficulty, that you know of, between Captain Hall and Captain Buddington, or anybody else, since you had left Disco, until this time?

Answer. No, sir; no serious difficulty that I was aware of.

Question. How did Captain Hall and the doctor get along?

Answer. Not very well. I believe the doctor never had any words with him, however. Captain Hall was sometimes a little stern with the doctor, but he never had any words with the captain. Captain Hall did not think the doctor was qualified for his position; he said so, but the doctor did not have any words with him; at least, I never knew of any. Captain Hall died on the 8th day of November, and was buried on the 11th, fifteen days after he was first taken sick. He was buried on Polaris Bay shore. All the ship's company were present. I know of none absent unless it was the cook and the steward. I dug the grave myself as well as I could, but the ground was frozen very hard; it was like flint. It is a shallow grave, but sufficient to cover and protect him. I dug the grave with picks and ice chisels and axes, and any way I could

cut through the ground. I had a portion of the crew with me, three or four men. Mr. Chester, I think, helped me in digging it. I think we spent two days at it. There are some accounts in the newspapers of Captain Hall's calling people into the cabin after he came back from the sledge journey, and encouraging them, and saying what they were going to do; but if he called anybody in, it must have been when I was not present. This brings us up to his death. The winter we passed was wretched indeed. Captain Buddington assumed command after that, in his way; and the winter passed over, and the spring came on, and there was nothing done. Nobody was allowed to go. He swore that nobody should do anything; and he kept his word.

Question. How came he to do it?

Answer. He swore to me he would be damned if anybody should do anything, but he allowed us to attempt an expedition with the boats. I told him, when starting the boats north, that he knew very well those boats could not do anything. That was in June. We lay there inactive till the 8th of June, 1872, when I started. We were inactive in many respects, but we went hunting; we killed musk-oxen, and one bear was killed, and some seals. The doctor collected quite a number of specimens; some few eggs, birds, ducks, geese, plover, and gulls of different kinds. I believe the doctor made some photographs of the ship at she lay in the ice, and he was about making a photograph of Captain Hall's grave when we got under way. We lay there inactive until June. Then I started on the 8th of June, and was told to see how far I could penetrate with a whale-boat. Mr. Chester had another boat. There were two boats. Dr. Bessels was with me, and Mr. Meyer with Chester, both of the scientific department. The crew were Peter Johnson, William Nindemann, (these two are here now; the other one is on board the ship;) Henry Stobbey. Augustus Linguist was another. He is on board the ship here. Mr. Chester started the day before I did. I had written orders from Captain Buddington. I believe they were left in the boat I went north with. I had to leave the boat in Newman's Bay. Mr. Chester lost his boat on the 9th day of June, and everything there was in her—crushed by the ice. On the 10th day of June I started north with mine alone, and got as far as Newman's Bay, in latitude 81° 57′. I started from what is called Cape Lupton. There was a place there where we could get into the water, where the ice set from the land, and I followed the water up to Newman's Bay. The north cape of Newman's Bay is in latitude 82° 1′; the center of it, as near as I could get at it, is 81° 57′. The bay is four or five miles wide. I remained up there until along in the early part of July. Mr. Chester returned to the ship by the land, with his crew. Then he took the canvas boat, and tried to reach the north with her, and got up as far as I was, and the ice would not permit us to go any farther. I waited there until Captain Buddington sent word, as Mr. Chester and some of his crew were gone from the ship, to come back to the ship, and they said she was leaking very bad, and he wished our help. I hauled my boat ashore with great difficulty up at Newman's Bay, and walked overland to the ship. Mr. Chester remained a number of days, with his boat, but finally hauled her ashore, and returned by land, leaving his boat there. The whale-boat and the canvas boat are both there now, and the other whale-boat was crushed. We lay around the ship until we started for home, doing nothing in particular. It was the 12th day of August when we started. The ship was leaking some in the stem forward, but the leak was not very serious. We did not make any attempt to stop it at that time. We could pump out in four minutes one hour's leakage, and we pumped her every hour. The leak

was at the six-foot mark, the mark showing when she drew six feet of water. It was entirely due to her lying upon a berg all winter. In the month of November a heavy gale of wind broke the ice; we swung to our anchor, and swung against what Captain Hall called Providence Berg. We lay there through the gale, and, on the abatement of the gale, she was allowed to remain up on the ice, and the ice formed around her. We could have hauled her off in the commencement, but the vessel was allowed to lie there. The consequence was that she was pressed farther and farther on to the spur of the berg, and lay there during all the winter. She fell over on her beam-ends, and the six-foot mark being above the ice, she started her stem, and there was the leak. It was not the fault of the ship that this happened, or that anything happened at all. There was no attempt made to repair it. I thought there was rise and fall enough at the spring tide to lift her stem up enough to get at that leak. I proposed to do that. The tides rise and fall at the spring-tide about seven feet. We could not have worked long upon it; but we could have worked a short time at every tide, and worked several tides. I got back to the ship from my trip north on the 8th of July. At that time they were pumping by steam with the donkey, and instead of calling on us to pump, we remained until Mr. Chester arrived, and then we did nothing, though shortly after his arrival we did pump some by hand, perhaps for five or six days. Then the steam was put on again.

Question. Did you know of any consultations, as to the question whether you should sail for home, between Captain Buddington and Dr. Bessels?

Answer. I do not know. Buddington had asked me about going home long before that. He asked me if I wished to stay another winter. I told him no. If a man swears that nobody shall do anything, I want to get home as soon as possible. I thought that, under the circumstances, with him in command, I would rather get home. We started for home on the 12th day of August. The ship was leaking still the same. The leak did not increase any at that time. On the 15th day of August we were beset in the ice, just north of Cape Frazer, in latitude 80° 2′ north. The cause of that, I think, was that Captain Buddington got intoxicated, and run his vessel off in the middle of the sound. We drifted from that point over opposite Kane's winter-quarters, close to the land, not twenty-two miles from the shore; it was near Rensselaer Harbor, and we drifted along by that harbor, and were working through ice all the time; but we got worked off from the shore into the middle of the straits.

Question. Was Captain Buddington drunk at the time you were beset?

Answer. Yes, sir; he was drunk; not on rum, but with alcohol.

Question. How do you know that?

Answer. It was all there was to get drunk on; he got it from Dr. Bessels's stores.

Question. How do you know that?

Answer. The doctor caught him at it, and they had quite a tussle together; I was not present; I was on deck.

Question. Tell all you know about that.

Answer. Captain Buddington was drunk, and the doctor said he was going to catch him. He went into the pantry, where the natives were, and secreted himself there. Captain Buddington came down to take his nip, and the Doctor came out of his hiding-place and took hold of him. The doctor did not keep his alcohol there, but Captain Budding-

ton had secreted some there, and he would go down and take his nip. There was no liquor on board, except this alcohol, at that time.

We drifted on until the night of the 15th of October, when it was blowing from the southwest. We had a great deal of provision on deck, placed there in case of an emergency. The engineer came running up out of his room, and reported that the vessel had sprung an additional leak. Captain Buddington cried out, "Throw everything overboard." As the vessel, by its motion, would break away the ice and lose everything thrown down near it, I tried to get it out of the way, and cried out to stop a moment until I could remove the stuff. Some of the crew came to help, and commenced lugging it away; but still much ran under the ship. It was a dark night, and I could scarcely see the stuff as it was on the ice or in the water. We worked in that way three or four hours, perhaps, when the ice on the starboard side let the ship loose again. We were at first tied to the floe of ice by hawsers, but when the piece on the starboard drifted away, she righted from her beam-ends and broke away. I went on board just before she broke loose, and asked if the vessel was making any more water than usual, and was told that she was not. I found that the engineer's statement was a false alarm. The vessel was strong, and no additional leak had been made; but as the ice lifted her up, the little water in the hold was thrown over, and it made a rush, and he thought that a new leak had been sprung. When I found she was making no more water, I went on the ice to try to save the provisions, if possible, and after a short time the ship broke away in the darkness, as I have described, and we lost sight of her in a moment. It was a terrible night; the wind was blowing strong from the south-southeast; it was snowing, and fearfully dark; the wind was very heavy, and the snow and sleet prevented any one from looking to the windward.

Question. How did you happen to have all the Esquimaux on the ice?

Answer. I cannot tell, of my own knowledge. They told me that Captain Buddington told them the ship was going to be lost, and they must get out. They were not there when I first jumped on the ice; after I had been there at work a long time, I saw some of them there. I saw Joe's wife and some of the children; I did not know who were there until after it became day-light.

FRIDAY, *June* 6, 1873.

Examination of Captain TYSON resumed.

The ship was off Cape Frazer when we were first beset in the ice on our return. We made several unsuccessful attempts to go to the westward, but could not get out of the large floe. That means a large cake of ice that is solid. The floe that we were tied to was about five miles in circumference; we were tied with large hawsers and ice-anchors. That was done as soon as it was ascertained that we could not get out; and we drifted with the cake of ice. In the latter part of August and the first of September our drift was very small; the winds were mostly from the south; and we drifted from one to five miles a day. Finally, when the north winds set in, we drifted fifteen to twenty miles a day. There was a constant drift southward, no matter which way the wind blew; and we drifted from the time we tied up to the ice in August till the 15th day of October, when this pressure occurred. Shortly after we were beset, new ice formed around on the other side of the vessel.

It formed several times and broke away several times, and formed again. The last time I should think it became a foot thick, and the ice-floe on which we were became jammed between the bergs, and that separated the young ice from the old, leaving the outside of the ship exposed to any ice that might come along. Shortly after the new ice broke off a large, heavy floe came in. We could do nothing, and of course the piece to which we were tied was stationary. If it had been outside in a drift, there would have been no pressure; but being stationary, and this floe coming up against it, caused the pressure. Then they got frightened at the report of the engineer, and there was quite a panic on board. The boat was lifted but a little, but it was then that the things were thrown overboard which had been placed on deck in case there was danger. There was pemmican, bread, a barrel of pork, a barrel of molasses, rice, meal, and medicines. This was on deck ready to be thrown overboard. There was a great quantity of pemmican—that is, dried meat put up in cans of forty-five pounds. I suppose there were three or four thousand pounds, perhaps more. On this floe I had erected a house, with a small frame made of poles. Captain Buddington would not give me any lumber out of the vessel. He wished me to get one up, so that if the ship should be lost there might be a shelter, and I made it of hard-wood poles. I made it in December, and over it I had a canvas covering. I wanted the house finished and some provisions in it, so that, in case of accident, the crew might flee to it from the ship, and have something to live upon; but it was not done. It was on the main floe to which we were anchored. When this alarm occurred, a good deal of this stuff was thrown overboard and some lost; in fact, a great part of it was lost. Provisions and everything else on the ice went adrift when the ice broke under us. When these things were thrown overboard, the ship was lifting and breaking the thinner ice, and many things were lost. There was a portion of the crew came out when I called for help; still, I wanted more help, and I called for it, and some more came out. It was dark, and I did not know how may were there. After I had been on the ice some time, I saw Hannah on the ice, as I have said, and I saw Hans' wife and children. I did not lose sight of Hannah, because she was hard at work helping us, and hauling things from the ship. I do not recollect seeing Joe nor Hans; I suppose they were getting their things out of the ship—their guns, ammunition, and one thing and another. There was considerable ammunition on the ice; that was all that saved our lives. It was on the after-part of the deck, and was thrown overboard. This work went on from about half past 6 o'clock till 10, or nearly 10, before the ship finally broke away. The time seemed long, and we were working all the time; we worked till we could scarcely stand. They were throwing over constantly to us. I think it was about 10 when the ship broke away. I was at work on the ice, dragging provisions away, when the pressure ceased from the starboard side, that is, the open side. I went on board the vessel, and I saw Captain Buddington in the alley-way, and I asked him what water the ship was making. He replied, no more than through the summer. I was not satisfied with that, but they were pumping with the little pump in the starboard alley-way; two of them were pumping, and I saw that the pump sucked, and that she was easy; but I no sooner got back on the ice than I heard a snapping. I called to Captain Buddington, and hoped he would cease throwing things over. We had but two boats left; those had been lowered on the ice; we had four when we started, and one canvas boat; one was lost by Mr. Chester in the ice when he was trying to get north,

and the other I had been obliged to leave ashore up at Newman's Bay. The canvas boat, which was good for nothing, was also left there, so that there remained but two boats attached to the ship; they were two whale-boats, that would carry eight men easily; six is a boat's crew; we could carry twelve on a pinch, in smooth water, quite easily. These boats were put on the ice during the panic, while we were throwing provisions over. They had the oars and sails, and everything that belonged to them in the boats, kept there habitually, in case of accident. I told Captain Buddington that the ice was cracking, and asked if he would haul the boats on board. He ordered me to haul the provisions farther back from the ship, and farther on to the ice. I did so. I think it must have been nearly 10 o'clock then; I went on hauling the stuff back, but it was not more than five or ten minutes before the ice exploded under our feet, and broke all to pieces. It broke from the pressure between the bergs. I could not see then, because it was so dark, but in the morning I could see the reason. I knew the ship must go adrift when I heard the ice cracking. I walked back to see where I had deposited some provisions, and in returning toward the ship the ice broke up under the pressure, carrying some of the men adrift on the smaller pieces, whom we got off afterward. The ship went off instantly. We had the boats; they were across the last crack that had been opened. The children I found lying there on some skins. I did not discover them till I was hauling the boats over farther on the ice, and there were the young ones under the skins. They were on the musk-ox skins, and lying right across a crack in the ice. If they had not been on the skins they would almost have gone through. We took the children, and hauled the boats across on to the main piece, and I did not see anything more of the ship that night. The ice we were on was nearly a circular piece, and about four miles in circumference. It was not square by any means. It was of different thickness. There were fresh-water lakes and hillocks; places where the fresh-water lakes had formed in the summer, under the high parts of the ice. I suppose that on the mounds or hills of the ice it might have been thirty feet thick, and on the flat parts perhaps not more than fifteen or ten. It was not difficult to traverse at all; it was rough. There were hillocks of snow and ice on it, from the thawing of the previous summer. The surface was all fresh. A great deal of the surface was snow. I do not suppose these heavy floes are formed at sea, but are formed on the plateaus above, on the declivities of the shore. They cannot form at sea. When formed, they slide off into the water and float away. All this that I have been describing so far happened in the darkness. I got some men off the cakes of ice in the darkness; I cannot remember now who they were. We launched a boat off the main piece of ice that remained firm, and got them off the pieces that were broken. The ice was running very quick, and we had to do everything quickly or not at all. We had, besides the boats, the "donkey," or a little scow, on the ice. I had forgotten to mention that. I shoved the whale-boat off. The men were distant thirty or forty yards. I discovered men with the other boat also, hauling her away from the water, for fear the ice would break. Those men got off several men from the small pieces of ice, and then hauled the boat up again. There was nobody lost in all that time. I do not think that anybody who was on the pieces was lost. Had it been so, these men would have reported it. I did not know at the time who was on the ice. But afterward. I could hear of none. So that I do not think anybody was lost; I think that all the other people not with me on the ice are on the ship. After getting the crew on the ice, most of them rolled themselves

up in musk-ox skins till morning. We had not one apiece, but we had some that we had saved, and some were large, so that two could crawl in under them. They were almost snowed under. It was dark, and I saw no more of them. I did not lie down that night; I walked the ice all night; I had nothing to lie upon. In the morning, of course, I looked anxiously for the vessel, supposing I could get to her again without any trouble. But when the light came, and while the men were still lying around, and I looked for the vessel, I saw nothing of her. I then concluded I must try to reach the land, as we had not provisions enough on the ice to sustain the party all through the winter. The question was, could we reach the land? I was in hopes of finding Esquimaux to assist us, if we could reach the land. Seeing nothing of the vessel, I supposed she might possibly be lost in the night. I called the crew out; and I had some difficulty in mustering them. Some of them were snowed under—out of sight entirely. It had been snowing all night, but it cleared up in the morning. I do not think the snow came till nearly nine o'clock. I called the crew together, and, after mustering them, I told them we must reach the shore. They concluded to go; but they were very tired, and very hungry, and very wet; they had had nothing to eat since three o'clock the day before. They tried to cook something. They made a fire out of some wood they found on the ice; they had nothing to cook in but some flat tin pans, and they tried to cook some of the canned meat, and tried to make some coffee or chocolate. Some of them shifted their clothing. Finally, I got started. Now, this piece of ice being fast between the bergs, it remained stationary. The wind had hauled to the northeast. The bergs rested on the bottom. Could I have started sooner, I should have reached the land on the ice. The wind had hauled to the north-northeast, I judged; I did not take the bearings of it; but it was down quartering across the land. It brought the loose ice down, and when I got half-way to the shore it brought the loose ice down on my bows. It was not ice to stop a ship; a ship would go through it, but a boat could not go through. I had left nothing on the ice but six bags of bread, which I would endeavor to get, if I once got to the shore. My further progress was stopped when within a little over a mile from the small island. I hauled up upon the ice. I did not dare abandon any of my provisions, or I could have gone to the land. But here were eighteen persons to be supported. When I had hauled up on the ice after being stopped, I discovered the ship up above us. She came around a point which was about eight or ten miles distant. We could see water over the ice that had drifted down, and we could see water in-shore. The wind was blowing, quartering off the shore, and making more water all the time. I watched the vessel, and set my colors for her. I had a flag, which I still have, on the Frolic. I watched the vessel; she was under steam and sail. I saw her through the spy-glass. I then went to work securing everything. I could not see anybody on board the vessel. She kept along down by the land, and finally I lost sight of her behind the land, which I supposed to be Northumberland Island. I had some poles at the house that I built, and I erected a tent to protect us. I told the men to go and get the poles; and in going they opened this bay, so that they could see behind the island. When they came back to me, they reported that the vessel was in behind the island, tied up. I did not know what to make of it. I took the spy-glass, and, running to a point, I saw she was tied up behind what I supposed to be Northumberland Island. I suppose she was tied up. At least all the sails were furled, and there was no smoke,

and she was lying head to the wind. The wind must have been off the land in the bay. I supposed she was tied up to the bay-ice, which I could see with the glass. My piece of ice commenced drifting just before I saw the vessel; and we drifted southward. I told the crew that I did not feel right about the vessel not coming for us. I told them we must endeavor to get to the other side of the floe, and reach the land, perhaps lower down than the vessel was, and I would eventually reach her. I told them to prepare the boats. I threw everything else away except a little provisions, enough to last two or three days. I told them I would run across the ice and see if there was an opportunity to take the water, and so reach the land. I run across as quick as I could. I was very tired, and had nothing to eat. I saw there was an opportunity to go through. The small ice did not get in fast enough to prevent my getting across. In these gales the ice runs very quick, and you are liable to be frozen up at any moment. I hurried back to the boats; I told them we must start. There was a great deal of murmuring. I insisted upon going. They insisted upon carrying everything, and much trash that they did not wish to lose. The consequence was, there had been no discipline. They loaded one boat full. I saw I could save but one boat. I ordered the natives to follow me across the floe. I had not gone more than two hundred yards before a hurricane burst upon me. I got across the ice; but when I got there I saw the natives had not followed me. Whether they thought too much of their property or were afraid of the storm, I do not know, but the cook was with me, and he ran back to where the natives were. One or two murmured about getting in the boat; but I would have shoved off as long as I had strength, but when I looked for the oars there were only three, and there was no rudder. I had told them to prepare the boat, but in the confusion I did not take notice of that, and when I got there I saw there were only three oars. It may have been negligence on my part; I did not probably think so at the time. I told the men to prepare the boat; to have all in her--oars, rudder, and sails; then I found they were all in confusion; they did not wish to go. Possibly I could not have reached the land had I been fully equipped, as the wind was blowing furiously. But I should have attempted it if I had had the oars and men to assist me; but I had only three oars, and we were blown back like a feather. I was thus compelled to haul the boat back on the ice again. I wanted to do so, but the men were exhausted, and I could not blame them for not working. The night was coming on, and I had to leave the boat with nearly everything in her. I left the canned meat, some clothing, and what little other stuff there was in her. I went back, and put up a little canvas tent. It snowed heavy, but in the morning it melted, and I could see the land. I was then some thirty to thirty-five miles from the ship. I could see where the ship was, and all that there was between me and the vessel. There was the boat and six bags of bread on the other piece of ice. I called the crew to get it, but they could not do it; they were afraid to do it. I had to let it go. I had no way of enforcing my commands. I did the best I could, but I was all alone. We drifted away from that piece over to the southwest. The crew were all on the other piece, and I called on them to assist me in saving the provisions and bread that was on the other piece, but I could not get them to do it; I had to let it go. We drifted away on the small piece, from the large piece which had the six bags of bread. I lost sight of it. As soon as the weather would permit, I told the natives they must commence sealing; we must have something to eat. We shot three seals one day. The separate floe that we were on was, perhaps, one hun-

dred and fifty yards across each way. After we got the three seals, the weather came in bad again. I had lost my compass; it was in the other boat. I supposed the wind to be southwest. The weather continued bad several days; but when it cleared I was within about six miles of the east shore, I supposed. But the ice was very weak between us and the land; it was the new ice; I could not walk on it. I was waiting for the ice to get firmer, when, one morning, Joe, spying around, saw the end of the boat on the same floe we had lost. He called me and I saw the boat. It was about twelve o'clock in the day, and we had not had our breakfast. We started over for the boat, and brought it back, and so got all together again. We put the bread into the boat. I had some dogs with me; five or six came over to me from the piece of ice. When I say "me," I mean my party. We got the bread into the boat, and attached the dogs to the boat, and dragged it and all the things that were there over to the other piece of ice that we were encamped upon. There we saved it all. We had all together again. I now concluded it was my duty to reach the shore as soon as the ice would permit—as soon as it was firm enough. It was very rough. I had no sledge, so I must work at a disadvantage. I did not dare abandon any provisions, for fear we never should see the vessel again. As soon as the ice got strong enough, so that I thought it would support the boats, I loaded them, and attached the dogs to the boats, and dragged them one at a time. Now, the large piece of ice lay about half-way to the shore; between it and the small piece we were on. There was no sun then, but it was light about six hours in a day. We dragged the boat over to the floe, and then went back and got the second one. We still had two kyaks there. The natives got them out on the ice. They will tell you, perhaps, how it was that, when Captain Buddington hurried them out of the vessel, they got their things out. We then had the principal articles on the heavy floe. It was then dark, and we could do no more. The next morning the wind was northeast, and we were drifting off rapidly. I called the crew together. I wanted them to save the kyaks, and to save the little stuff there was on the other floe. I wished them to do it, but I could not get them to do it. Joe went over on foot, and got some of the stuff, and then two of the men ventured across and saved the kyak. One of them was the negro cook and the other William Nindemann. We drifted off in the darkness, and I could not see any thing more for a number of days. It was darkness and storm all through the month of November, I believe. The first land I saw was January 19. We were now all on the same original piece of ice to which the ship had been tied. It was still a large piece, and only one corner had been nipped off—still four or five miles in circumference. I had then recovered my compass, and we made snow-houses on the ice. We had lost sight of Northumberland Island, and could not tell how fast we drifted. It was all night then, and darkness.

Question. How did you live on the ice?

Answer. We built our snow-huts. We were compelled to build them in the night. We all assisted. Joe sawed out the blocks. They were built of hard-packed snow, packed by the wind. They are sawed out with saws. They are square blocks, about two and a half feet by eighteen to twenty inches thick. We laid them just as you would blocks of stone in laying a wall. The huts are built bee-hive shaped, with a hole large enough to crawl into them at the bottom. They were a little more than six feet high inside. There was one hut for the men; there were nine of them in one hut; Hans' family were in another; and Joe, Hannah, their child, and myself in another; and there was another hut

for the store-house. Mr. Meyers lived with the men. I can scarcely tell you how we lived in those huts. We all got in. We had a few musk-ox skins. We got the old canvas from the old tent, and laid that for a flooring; then laid a musk-ox skin over that; and then we had a skin over us. We had two lanterns; we burned them for light. We made them from old tin pemmican-cans. We made our drinking-vessels of those old meat cans, and we made our Esquimaux lamps of the tin pemmican-cans. An Esquimaux lamp is composed of stone generally. They burn oil. It is in the form of a shallow dish, and the wicking is laid on around the edge. The dish is filled with seal-oil, and has a little wicking around the edge, which is lighted. The Esquimaux use moss for wicking. This makes a flame of about the height of that of a common lamp. The wick, resting on the edge of the lamp and partially in the oil, draws up the oil as it burns by the heat. We had no moss, and so we got the canvas, and cut that up for wick. The men did not burn any at first, but we burned one in our hut. They did not want any for heat, as there were so many of them in the hut; and, besides, they did not know how to burn one. They cut up one boat to burn for heating water. After they had consumed the boat, they had to come to the lamp. They were taught how to use it, and got along very well with it when we got sufficient oil for them. We had eleven and a half bags of bread, fourteen cans of pemmican, weighing forty-five pounds apiece. It is concentrated meat, eaten in the form of soup generally, sometimes just as it is in the cans, being already cooked, and sometimes it is warmed up simply. We had fourteen hams, probably weighing nine or ten pounds apiece; they were small ones. We had ten dozen cans of meats and soups, one and two pound cans; one can of dried apples, weighing twenty-two pounds; and about twenty pounds of chocolate and sugar mixed together. We had chocolate about four times, when some of them got into the store-house, and ate it all up. That is all. The provisions were kept in the store-house, and served out by weight. Mr. Meyer got up some weights from shot, and it was weighed out. The daily consumption for each person was eleven ounces. I established that ration. There was much murmuring about it, but we had to come lower than that afterward; I established eleven ounces of bread and pemmican. Occasionally we would change, and, instead of pemmican, we would take ham. But the men bore it well, considering, though there was a great deal of murmuring at first. The change was so sudden that it weakened them all down. I was so weak myself at first that I staggered as I walked, until I got accustomed to it. I came up afterward. But the men bore it very well after we got accustomed to it. They were late in seeing the reason of it.

I endeavored to maintain the discipline of the party as well as I could; but there was little or nothing that could be called discipline. Every man was armed with pistols but myself; I was on the ice without anything, and they did as they pleased. I could merely advise them. They had been under no discipline on the ship, and on the ice it was no place to establish discipline without assistance. If I had attempted to do it by force, I could have made an example of one of them; but why should I? They were all leagued together. I endeavored to preserve discipline, but I could only do it by advice, and doing the best I could for all of us.

Question. Did they get better afterward?

Answer. They got really no worse. They had many plans of their own, concocted during the winter, but they did not know how to carry them out, and so it all ended right; they all had to come eventually to

me. I did not have a soul to assist me; Mr. Meyers was sick much of the time. I was clear from the rest of the party, and relied principally for assistance on the ice on the natives; and toward spring they got frightened, and really I thought they were going to make disturbance; but it was through fright; they were afraid of starvation. There was no guard over the provisions; but it was so that we could tell if anybody went in to the store-house. In such a time, in an Arctic winter, we could not keep a guard, clothed and fed as we were. We suffered very much from the cold. If we had had enough food, we would not have cared for any other thing. Mr. Meyers had some position as an officer, but he was not well; he was not well when we came on the ice, and has not been well at any time on the ice; he is well now. I could merely advise the men; I told them what the consequence would be if they ate up the provisions before a certain time.

Question. What was your plan?

Answer. My idea was that we should drift to the west, and that we should probably get ashore at Hudson's Straits; I did not suppose we should drift so rapidly. Could I make the provisions last till March, I knew we could get an abundance of seals, and once getting into the mouth of Hudson's Straits I could find natives. I knew a number of tribes along the coast, and they knew me; and eventually I should get to the ships. But I was drifted past all these places, so that it was necessary to get seals as much as we could. We began to get them about the first of March; we had caught a very few—now and then a seal. We had no blubber, so that we were fearful we should have none for light. But when it was all consumed, the natives would catch another small seal. They were caught in the cracks of ice in the water—speared or shot. In March or April anybody can catch them on the ice. Early in March we caught a good many seals—I could not tell how many; some days six, eight, or ten a day, or three or four a day. We had all the meat we wanted then. The latter part of March we were driven to sea off Hudson's Straits. I did not see the land, so as to know where we were; but I knew by the current I was off the straits. I made land in about latitude 74°. Then I saw Cape Walsingham, which is about 76°. I had been along there before, and I thought I recognized it. But when I was off Hudson's Straits I knew it by the currents and by the seals we were getting. It is the only place where we can get what we call the bladder-nosed seal; or some call them the hooded seal. I knew where we were by them; and I told the men that, if they would be patient, we would find bladder-nosed seal. And we did so; we got quite a number there. Soon the pups appeared on the ice, and we got a number of them. We shot a bear also on the ice. He came on over the ice. They cruise everywhere by sea on the ice. I have met them a hundred and fifty miles from land. It was evening, and we discovered him out there eating some skins and blubber. We had some difficulty in getting to our guns. I finally got to a rifle, but the cartridge refused to go. I got in and got a new cartridge, and shot him directly through the heart; killed him at once. In the latter part of March we were driven to sea; and now it became necessary for us to get off the piece, and abandon the snow-huts we had occupied all winter. The piece was then not more than twenty-five paces across; the water was nearly up to the hut-door. The ice had all broken up. Either way you could not have made twenty-five paces without going off. The huts had been placed on the highest and stoutest part of the ice at first. One boat had been cut up for fuel, and we had but one. I had accumulated enough meat to last through

April, and, perhaps, till the middle of May. I had laid in that stock in hopes we could cling to the piece of ice until we could reach Labrador. But we were driven off; on the first day of April we left that piece. I tried to carry a portion of the meat. We had repaired the boat, and tried to carry off the meat. I repaired it by putting some copper and seal-skins over the hull. This boat is now at Bay Roberts, Newfoundland. I found we must get to the pack-ice for protection—the ice that drifts along the west coast in a solid pack. Our piece was off to sea. So I took the boat and all the gear I could carry, arms, and a portion of the meat. But before we got to the pack, there was a little sea on, and I had to throw the meat overboard. That disabled me again, but I got to the pack the second day, with all the men, women, and children. I stopped the first day, and hauled the boat up, and lightened the boat, throwing over everything we could well spare, and the next morning launched again, and went toward the west. The next night I hauled up again. I got a little way into the pack in one day, and the next day a little farther. It was blowing heavy, and we were finally stopped, and hauled up on a large, heavy piece. The ice closed in around us, and the gale smashed the ice all about into pieces, and broke the piece on which we were up into a small piece, comparatively. The other ice around us was smashed. We had a little bread left and a few cans of pemmican. Being without meat, and not able to get any seals, we had to live on the pemmican and bread which we had. We came down to as small a quantity as we could live upon, and lived in this way several days. We were still on the piece of ice we had got on to when we got into the pack. I think it was then, on the 20th of April, that a heavy sea drove in and washed us nearly off. We stood by the boat, the sea breaking over us, and washing large pieces of ice across our piece. We were in this condition, clinging to the boat, all night. The children were in the boat. In the morning we launched our boat, and got on to another piece of ice that was riding more easily in the sea. It was a fearful night; we were all wet through, and were never thoroughly dry afterward until we were picked up. After we got on to the last piece of ice we rode the gale out, but had scarcely anything to eat. I myself, on the 22d day of April, ate a piece of dried seal-skin; and the next day I should have eaten the kyak. We had with us now one boat and the kyak. The kyak had a string to it, and we hauled it from the other piece of ice. The kyak is now on board the Frolic. We rode the gale out on that piece, and we were nearly starved. We had two biscuits, ten to the pound, a day, and a little pemmican. On the 22d day of April we had nothing left but the kyak and some dried seal-skins. That night a bear came along, and we shot him. We saw him at a distance, and all hands lay down upon the ice; and the bear, supposing we were seals, came close by. We had no guns but those of Hans and Joe; and Hans and Joe both shot him. We bound a line to him and hauled him on to the ice, and cut him up, having a hearty meal. We ate the meat raw; the blubber was very poor, and we could not cook with it; we used often to make fire for cooking with the fat of animals we killed, and so cooked; but this was too poor. A few days after this we got into the water again; that is, we launched the boat; the ice opened. As we went on we found seals—picked up quite a number on the ice; we took what we could carry, and kept on in that way until we were picked up. When picked up we had three large bags of seal-meat—entrails and skins. We never wasted anything when we shot an animal. We were picked up on the last day of April, on a small piece of ice; it was 5 o'clock in the morning. The day before we saw

two vessels; one was close to us. We fired and shouted to them, and set colors. We heard their guns, but heard after we arrived at Saint John's they were shooting seals, and did not see us. The ship was the Eagle, I believe. The next night I kept fires burning all night—fires of blubber. I had three fires, and they made a blaze two feet high; I was in hopes some of the ships would see it; but it came up foggy, and nobody saw it. About 5 o'clock in the morning the Tigress came along in the fog; we fired guns and set up colors. They heard nothing, but they saw the colors. I ordered Hans to launch the kyak. He did so, and kept on and paddled up alongside the steamer. He sung out in his broken English, "American steamer." The Tigress steamed up to our piece, and took us off at 5 o'clock in the morning. We had hard time on the ice when we left our original floe. At night we slept in the boat, half lying down at a time, the other half remaining on the ice, keeping a look-out. We all had to do what we could. I had no difficulty with the men at any time, but had, at times, cause of difficulty, but I said little, and got on as well as I could, for I knew that we could never be saved unless all stood together; that the moment we commenced quarreling, our lives would be in danger. One day in the winter one of the men threatened me; but he found he was not the man that he thought he was, and left. He came into the hut one day, and used abusive language about some pemmican, and about some of the provisions. It was about the distribution of it. Finally he said he could give me a thrashing; but he went off. He left the hut very suddenly, and came back and apologized. When the Tigress rescued us she was looking for seals; it was her second trip this season. She had eight or twelve thousand on board. The captain used me very kindly. He kept on sealing for some days, but finally concluded to clear up for home. He killed six hundred just before he started for home; but he could not get his ship up to them that night, and some other vessel got up there and took most of the seals, so that in the morning, when his ship got there, they found only two hundred and seventy out of the six hundred. He went into Bay Roberts, and there landed some of his crew and most of his boats, and started for Saint John's, and got there the 12th day of May. We were twelve days on board the steamer. She was a Newfoundland steamer, and was under English colors. When Hans said "American steamer," he meant that an American steamer had been lost. He was trying to tell them where he came from.

Question. It was stated in the papers that the scientific records of the party were on the ice when you were separated from the Polaris?

Answer. Mr. Meyers's records and those of Mr. Bryan were on the ice. Mr. Meyers had them all in one case together, and he lost them; how, I do not know.

Question. Did you keep any diary?

Answer. I commenced one after we went into winter quarters, but it was on board the Polaris. I had nothing on the ice. I threw overboard a bag that had two shirts in it, and two pair of drawers, and four pair of stockings. That was all of my gear that I had on the ice. I found them among the clothes-bags after we got adrift. I did not know the bag was there for several days, but on looking over the bags I found mine there. I changed my clothing once in six and a half months. I think some have diaries that they kept on the ice. I think Mr. Meyers has, and the steward, John Heron, may have. He is English. The cook was William Jackson. He is a mulatto. The latitude where we were picked up was said to be 53° 30′, longitude about 55°—off the

Wolf Islands. I saw the land there. I think it was about thirty-five or forty miles off.

Question. Do you think you could have got ashore?

Answer. I had got something to eat then; I do not know why we could not have got ashore; I had made more than that distance before in the boat. If the ice had opened I should have gone ashore. The islands are uninhabited; but in by the Wolf Islands there is Battle Harbor, and in the straits there are inhabitants, but none on Wolf Islands.

Question. Did anything remarkable happen while you were at Disco, and was there any difficulty with any of the officers or crew?

Answer. Nothing very remarkable, sir. The most remarkable thing on board I know of was the conduct of the sailing-master, Captain Buddington; I don't like much to speak of it, sir, but if I must tell all I know and thought, I must say that he was a disorganizer from the very commencement.

Question. How do you mean; how did he disorganize?

Answer. By associating himself with the crew, and slandering his commander, and in other ways that I might mention.

Question. Let us leave the whole of it.

Answer. Well, sir, he associated himself with the crew very much cursing his commander, and blaming him, and speaking slightingly ot him.

Question. Was it Captain Hall of whom he so spoke?

Answer. Yes, sir.

Question. In what way, particularly?

Answer. In his own way; I could not describe it to you.

Question. What seemed to be his ground of complaint, if any?

Answer. His ground of complaint was, that the captain was not a seaman. On the most frivolous things he would be among the crew and complaining of Captain Hall.

Question. Was he insubordinate to the captain in any way?

Answer. O, no, sir; he was very subordinate to the captain in his presence.

Question. Anything else?

Answer. Nothing more, in particular; he was inclined to take provisions, sir, and privately consume them.

Question. Was Captain Hall aware that he was acting in this way?

Answer. I suppose he was.

Question. Did Captain Hall have any particular difficulty with him or anybody else on board the ship?

Answer. Just as we were leaving Saint John's, he had a difficulty with Captain Buddington, and he threatened to send him home at Disco.

Question. What about?

Answer. I did not see it; as nearly as I could ascertain, it was about drawing the staple of one of the lockers that contained some provisions. I do not mean liquor; it was something to eat. I forget what it was, whether it was sugar or milk, or what.

Question. That was the first difficulty you knew of?

Answer. That was the first words I knew of his having with Captain Buddington.

Question. Were you present at the conversation?

Answer. No, sir; I heard it from Captain Buddington himself. I suppose I may as well say how I came to hear it. He came out on deck, cursing as usual, and said it was likely he would go home at Disco; but he believed something would happen to get him out of it; he never

did get into a bad scrape that he did not get out of. Captain Hall called me into a room, and asked me about it. I told him I thought Buddington had taken a little too much, and that probably he would do better in the future; and it passed over.

Question. Did anything more of this kind happen at Disco?

Answer. All that happened, I believe, was that Captain Buddington broke into the liquor there.

Question. Where was it kept?

Answer. The liquor was some of it in the "run," down under the cabin; some was forward in some of the rooms. I found it afterward, on collecting it together, by Captain Hall's order. He commenced breaking into the liquor in the "run." The first that I was aware of it, I believe, was the day that the Congress left. He asked me if I wanted a glass of wine; I told him yes. He had a large chest back of the alley-way, and he opened it, and it was full of wine. I asked him who his friends were that sent him the wine. He said no matter who they were. The wine was claret, in bottles—a light wine.

Question. Was this known to Captain Hall?

Answer. O, no, sir. In fact, nobody knew it at the time. I do not know where he got it.

Question. Was it known that he had it?

Answer. O, no, sir.

Question. When you left the Polaris, Captain Buddington was in command?

Answer. Yes, sir. Nobody disputed his command from the time that Captain Hall died until our separation. There had been no dispute of Captain Buddington's commands. We were all law-abiding people on board. There was no violence whatever at any time. I believe about everybody thought the command was not a good one; but we still all submitted.

Question. Did you know of any difficulty between anybody who was left on board and Captain Buddington?

Answer. Nothing more than that feeling that will always be between an incompetent man and a subordinate who thinks him so.

Question. What kind of a man was Chester?

Answer. A peaceable, good man under a good commander.

Question. Morton, how did he get along?

Answer. He is an honest man; but we all know he is not a sailor. Keep him straight, and he is honest and fair.

Question. Then, so far as you know, there was no open rupture of any kind between anybody and Captain Buddington?

Answer. There was no open and lasting rupture. As I told you, the doctor and he had a little rupture over the alcohol; but it amounted to nothing. It was laughed off afterward.

Question. The criticism you have to make of Captain Buddington is, that he would get drunk when he had a chance?

Answer. The criticism I have to make is, that the man had neither heart nor soul in the expedition. It was not his intention to go north if he could help it. His idea was to go to Port Foulke, and spend his time, while the others tried to get to the pole; while he was taking care of himself the others should go on; and then he would return home with the rest. That was the headquarters he had fixed on; he did not want to go above that. He wanted the ship to lie there, and the rest to go on. That was his whole ambition.

Question. How did you gather that?

Answer. I gathered it from his own conversation. He tried to pre-

vent the ship from going up Smith's Sound; and after he got carried there, he finally succeeded in stopping her where she was stopped for the winter. As soon as Captain Hall died, he tried to have the ship return farther south. He swore nobody should do anything.

Question. Didn't he let you go off with the boats?

Answer. Yes, sir; but I told him we should lose them. He would not advise with the doctor, and between the two there was a mess made of it. There was no use in my saying anything at the time, nothing whatever. If he had started a sledge-expedition overland, there would have been a high latitude reached. I told him so, I think.

Question. How do you account for the ship's not coming to you to help you off the ice?

Answer. That I do not know how to account for. I was surprised that it did not come. It might have been that it was in a sinking condition, but I think not. I think the vessel that I saw under steam and sail at sea could not be in a sinking condition. But he went in there, and tied up. She was upright, and appeared to be all right when I looked at her with the glass.

Question. Have you any reason to think they saw you?

Answer. I cannot see how they could avoid it, if they were looking for us. It was daylight, and they were within four miles, I think. I had a flag of rubber-cloth set upon an oar, and that should have been distinguished quite a distance over the white ice. It was a large rubber-cloth, one that was made for lying upon ice. It was black, and easily to be seen. They could have recognized the shape of the floe as the one that they had been fastened to for months, and they must have seen such a body of men. I could have seen on board the ship; I could have seen the men if I had tried; but I did not take time; but I could have seen a man if one had been walking on the house. But the moment I saw her in safety, I knew we were about to be abandoned, for some cause or other, I could not tell why; I don't know whether it was for good reason or not; I can't tell without knowing the condition of the ship, and their idea of our condition. I had seen the pumps tried before she broke away, and didn't think she was making much water. But I do not know what injury she sustained after drifting away; I do not think she sustained much, if any, because the ice was loose. It is ice rushing in upon you between bergs that produces injury. But when she came down all day under steam and sail, and then lay by, I could not think it was right; at least while I was on the ice I could not feel so. There was land nearer, but not so convenient a bay as that where she lay. She will lie there till this July, and then she will break out. It may be that he thought we had all the boats, and supposed we would come to him. He knew that I had nineteen persons there; he knew that I had much provision, but he could not be certain that I had a boat. If he had been looking in the day-time with a glass he might have seen the boats, I think; but unless he did that, he could not have been certain that we saved the boats; but he would have known that we saved the provisions.

Question. Would not he naturally think that he should save the ship and let you come to him in the boat?

Answer. That may have been his idea; but at that time I thought the first thought should have been to save the people off the ice. When the wind changed so suddenly, it was his duty to come and save us.

Question. Still, the possibility may remain, that in securing the ship in the harbor, he may have supposed that you and the Esquimaux could reach him?

Answer. Yes, sir; I cannot imagine he would abandon us, but that it was a matter of bad judgment, and perhaps some indifference. The people on board would not have been content to abandon us if they had known it was the intention to do so. They might not have known that it was possible to save us, and if they did, they would not have known what to do, nor would their judgment have been good for anything in the matter. The health of Dr. Bessel was good at the time, as also that of Mr. Bryan, and indeed all aboard. Mr. Bryan was indeed a fine young man. He was busy in making his astronomical observations, and he was a pleasant, genial man—about the only one I found on board the ship to associate intimately with, and I was very fond of him. The ship had an ample supply of provisions to last the party there, should they keep to the vessel, until their arrival at Disco. They have enough to last them two years, if they live with economy. Should they stick to the vessel, this would be enough. I think that under almost any other commander the vessel would be all right, but under his command, I don't know. He could only get wood out of the vessel to make boats. I don't think she had over twelve or fifteen tons of coal. She used about five or six tons a day, generally, about five tons. They never had any blubber to make steam with, and the devices they took along for burning blubber were, I believe, thrown overboard early in the season.

Question. Was the vessel left in a position where they could get any food?

Answer. Yes, sir; there was game in plenty—walrus, seals, bears; and, in the summer-time, ducks and eggs. I believe there are salmon there at times. There is an abundance of birds in the spring in the vicinity of Northumberland Island. I am so informed by Hans, who has wintered there. I think about July they will break out if they stick to the vessel. It is about three hundred miles from Northumberland Island to the nearest permanent Danish settlement. If he had a clear way, he could make it in two days, and in about three days under sail. She sails well with good winds. She gets off five or six knots under sail, which is well for the amount of canvas she carries. But she is not easily handled under sail in rough water.

Question. Is there difficulty in an ordinary ship's getting to Upernavik?

Answer. No, sir, in the right season; say in July or August.

Question. What is the latest time that a steamer ought to start from New York to go to Northumberland Island or Upernavik?

Answer. If you wish to start one to intercept the Polaris, it would be well to start by the first of July.

Question. On the supposition the ship will not float, and he has to be rescued, what is the best time to go?

Answer. She should leave New York by the middle of July; she could then be at Northumberland Island about the 10th of August, which would be at the right time. It is not safe to stay around in that vicinity in September. A deep snow-storm may come, and form "pash," and stop a vessel very much. No sealers go there; I do not think the whalers ever go as high as Northumberland Island. They come up to Cape York once in a while. That is in latitude 76°. There are natives right off by Northumberland Island, and you can find them there; Hayes found them there. Hans says there are natives there; his wife came from there. The natives are peaceable enough now. They will find the natives coming around hunting there. Parties will be there, if they were not when they went in. They hunt up and down the coast, wherever the walrus

goes; so Hans tells me. I should not feel myself in any danger there if I was in a ship that would float.

Question. Have you any idea whether this will be an open season in that latitude?

Answer. No, sir; but I think it will. There have been northerly winds blowing all winter long, and heavy; I think the ice will be blown out of the country. There has been an unusual amount of ice off the Labrador coast. They have had nothing but north winds all winter, blowing very heavy indeed.

Question. Did Captain Hall intend to be away more than two weeks when he set out on his sledge journey?

Answer. I do not know his exact intentions; he said, on starting, that he would be gone about a fortnight. I don't know how high he expected to go that trip, but, speaking about it before he started, he said to me, referring to Captain Buddington, "I cannot trust that man. I want to go on a sledge journey, and I want you to go with me, but I don't know how to leave him on the ship; I want to go on this sledge journey, and I want to reach a higher latitude than Parry did before my return."

A few days afterward he told me he would leave me and take Chester. In case the vessel should break out, he wanted me there to assist Captain Buddington. He left written instructions, but I do not know what they were. He took Chester with him, and they got up to Newman's Bay, latitude 82° 6′. That was the farthest they got on that journey.

Question. What became of his papers after he died?

Answer. I do not know; I think the native Esquimaux Joe has some now in a box. I saw the handwriting of Captain Hall in the winter in a box. I told him to keep them safe. I understand since that he took them out of the ship. I am afraid that those which Joe rescued will be all that will be left of Captain Hall's papers.

Question. Was there no public examination of his papers in the presence of the officers?

Answer. No, sir; his journal was taken round, and scanned by one and another.

Question. Were they not certified and sealed up?

Answer. No, sir.

Question. Did not you mess with Captain Buddington?

Answer. Yes, sir; we messed with him.

Question. Did not you know what he did with the papers?

Answer. I did not know what he did; I saw some of them; I know many remarks were made about them; I understood some were burned; I cannot tell who did it.

Question. Did anybody suggest that the papers should be sealed up?

Answer. I did myself; that they should be sealed, boxed, and screwed down, and suggested it to Captain Buddington.

Question. What did he say?

Answer. He did not make any remark whatever, or merely his usual "Damn his papers."

Question. Did any come into your possession?

Answer. No, sir.

Question. Did anybody else suggest that they should be saved?

Answer. It was talked of, that his papers and books should be boxed and sealed.

Question. What became of the account of his northern sledge journey?

Answer. That was on board the ship.

Question. Did you see it?

Answer. I did not see it.

Question. Did he keep a regular journal daily?

Answer. Yes, sir; I believe he did; I think it was one of the bound books; one that could not be put in a pocket.

Question. When did you see that last?

Answer. I think it was after Captain Hall's death, and Captain Buddington was reading it.

Question. While Captain Hall was in a delirious state did anybody meddle with his papers?

Answer. Not that I know of.

Question. While he was delirious did Captain Buddington get him to burn up some papers?

Answer. He told me he was glad the papers were burned, because they were much against him; and he got him to burn them.

Question. Did nobody see him burning them?

Answer. I do not know; I heard it talked of on board the ship, and I supposed it to be the truth. There was something more in the journal that he would like to get out; but, of course, he could not do it. He told me that Captain Hall's handwriting was very peculiar.

Question. Did Captain Buddington keep a journal, or continue Captain Hall's journal?

Answer. I did not see any; Mr. Chester kept the ship's log.

Question. Who kept the reckoning, to navigate the ship?

Answer. Captain Hall.

Question. Did he take observations?

Answer. Yes, sir; he did it chiefly. He would have us all out, working up observations, to see how they would come together.

Question. Did you see the chart every day as you went north?

Answer. No, sir; I did not see the ship's position put down very often.

Question. Have you never looked at the chart upon which her track was put down?

Answer. No, sir; I think Mr. Meyer drew one up; but I am afraid he has lost it. That I have never seen. He drew it up through the winter.

Question. Was the ship's position marked on the chart every day?

Answer. Yes, sir; but we got off the chart; and we had to make an entirely new chart; and as to the localities south, Kane's and Hayes's were found to be in error.

Question. In whose charge would the new chart be?

Answer. It should have been in Dr. Bessels's, I suppose, after Captain Hall's death.

Question. Did Dr. Bessels have a chart of his own?

Answer. I do not know.

Question. Was he capable of constructing a chart?

Answer. I suppose so; but I do not know.

We found right opposite the place where we went into winter-quarters, in latitude 81° 38′, traces of Esquimaux huts. We found rings of stones laid around, and in digging about these stones we found spear-heads, pieces of bone, and small implements. These huts were possibly thirty or forty years old. The land there was entirely clear of snow. It was a plain. The soil on that plain absorbs the moisture rapidly. It is a light clay. I did not find any stone arrow-heads. All that we found were of bone. The spear-heads were made of walrus-teeth. All these things were delivered to Dr. Bessels, and are probably in his possession. If he has not lost them they are on board the Polaris. When we went

in there, in the latter part of August, all the land was bare of snow. It was about the 20th of August. All the land around the plain was bare of snow at that time. There is an elevation of 1,800 feet entirely destitute of snow. There were hills on the sea-coast, 1,800 to 2,000 feet high, entirely clear of snow. The soil absorbed the moisture very rapidly, so that it dried very fast. We could not see any inland summits; but as far as we could see the mountain-ranges in the interior they were all clear of snow. The temperature in summer is very hot on the land. On the top of the elevations it was warm. I crossed them in the summer. There are little bunches of flowers and willows. They have any quantity of specimens of these on board the ship. There is but very little grass, but there are these little flowers and willows and mosses in spots. The prevailing hue of the landscape is a dark gray. The highest elevation that I saw clear of snow I should judge was 2,000 to 2,500 feet high. In the distance I think I saw some 2,500 to 3,000. The willows run along the ground like a vine. The musk-ox is up there; we killed them; I killed twelve in one hunting excursion, in two days, to the north of this plain, in latitude 82°. We only killed twenty-six, all told; that was in the spring, on the north side of Newman's Bay. A musk-ox weighs about five or six hundred pounds, take them as they stand. They do not taste of musk at all in that latitude; they are as good as beef. I do not know where they go in the winter-time. All the tracks that I saw in the spring were coming from the southeast. In the interior, Newman's Bay runs southeast and northwest; and the oxen were coming from the head of the bay, from a southeast direction from off some feeding-ground they had; they were not afraid of us. The dogs that we had would check them off; as soon as the dogs approached, they formed a solid body, sterns together. We saw no wolves, but a few white foxes. When the oxen form thus in a body, looking at the dogs, all that the hunter has to do is to walk up and shoot them. I do not know whether they would be afraid of man; I know that in Hudson's Straits they will sometimes turn upon a hunter. They did not appear to be inclined to run for the dogs, although the men were in sight. Skins, skeletons, and horns were collected, and they are on board the ship. I did not see any reindeer. Joe and Doctor Bessels were off to the southward a little ways, and they shot a white bear; there are no brown bears there. We saw tracks of foxes; you always find foxes and bears where there are seals. The white bears up there are not as large as those farther south. The glaciers are so large south that I think they keep the snow on the land longer than where we were. I went right out where the land looked covered with snow and ice, and found it entirely clear of it. The temperature of the water was very low, but the land was clear of snow. We came upon land covered with snow and ice as we entered Kane's Polar Sea; but the northernmost point of land we saw was bare; I attribute it to the sun's shining continually there through the summer; it is very warm, and takes the snow off. I saw but few mosquitoes up there; there were flies, bumble-bees, and butterflies. I did not see any frogs up there, nor snakes. They collected a good many birds; there are some land-birds; I think they shot some ptarmigans up at the winter-quarters; some were shot when the plumage was changing; but they got very few eggs. There were ducks and brown geese, gulls, and ivory gulls. I did not see any penguins up north; I saw no whales there, or signs of any; we did not meet any whales on our cruise. The Polaris is a good ship, well fitted, and she was supplied abundantly, having a large superfluity of almost everything, in every way, except-

ing skin clothing, which Captain Hall relied upon getting on the Greenland coast; but he could not purchase any. She is a strong vessel; stronger than the Tigress, which rescued us; I saw her tried; she is a powerful vessel. You may take that as a fact, since she got up higher than any other vessel ever did and get out again, although she was badly handled. She needed nothing that could be supplied from the United States, that I can think of; she had an abundance of everything. And the quality of what she had was good as far as I know; some of it was very good, indeed. Some of it extra good; as, for instance, our potatoes, dried apples, onions, and pemmican, which was splendid. All the preserved meats were good, and the weevils did not get in the bread; it is too cold for that. The brown bread was good; the white was not so good. The flour was good. No fault was to be found either with the ship itself, its fitting, or its provisions. Of the northern lights I saw in the highest latitudes nothing but faint streaks, and those only occasionally; not so distinct as I have seen them in New York. The lights were northeast of us. We saw them most, and most brilliant, when farther down, in about latitude 70°, though I think we saw them most distinct in latitude 65° or 66°. Then, as we got to the latitude we wintered in, they were indistinct, and seemed to be northeast of us. It was a matter of discussion with the scientific people, and they did not know whether to call the streaks the aurora or not. I saw nothing in the direction of the magnetic pole resembling the aurora. We had very stormy, heavy weather, indeed; more thick nights than starlight. It blowed so heavy as to clean the ice right out. Another thing they did not know before is, that Smith's Sound is open all winter long. What I mean is, that the ice is drifting all winter long. It is not solid till the latter part of February or March. The water here is very deep, I think; very deep in Polaris Bay. The winds drive the ice with great force; and I have seen many gales clean the ice entirely out. The whole of the bays were clear of ice excepting a little that would hang in by the land. But in the dark, in the winter, we would not want to steam there much. There are shrimps there, but I never saw any fish there at any time. I believe some of them tried fishing with the hook and line; but I do not think there are any fish there. The seals live on shrimps; these are very plenty, and they were quite large, as long as the finger. I saw no crabs; there are jelly-fish; we saw them as far as we went to the north. I do not think I saw a rainbow there. I heard some one say he saw one, but I did not see either a lunar or a solar bow. When Captain Hall was buried Mr. Bryan read service, acting as chaplain. We had religious services, on Sundays, in Captain Hall's time, and some little time after his death; not long, however. In my statements I may omit some things that would be interesting. Everything in that country, no doubt, seems more commonplace to me than to others, and perhaps I do not think things interesting that are so. While Captain Hall was sick, I saw him every day. He was under medical treatment; Dr. Bessels was attending him. The doctor said that it was apoplexy; that was what he called it. He said he was paralyzed on one side; he said he ran a needle into his leg, and that there was no feeling in it. But after that Captain Hall somewhat recovered, got around, and was taken down again suddenly and died. He appeared to have the use of his side when he recovered. He appeared rather strong. He walked around the cabin, and I think did some writing. He did not say anything about being numb on one side. He took medicine, I believe; but at times he strongly objected to taking it, and to having anything done for him. At other times he would be quite docile. Those that were around

him at the time can tell more about it; Mr. Chester and Mr. Morton were his principal attendants. Perhaps Joe and Hannah may have been with him. While he was sick I was out banking up the ship every day; and as it appeared to be the desire of Chester and Morton to watch with him every night, I kept one side. The doctor gave him his medicine, I believe; I do not know as he took medicine from anybody else.

Question. Have you any opinion of your own as to the cause of his death?

Answer. I thought at the time that the man came to his death naturally; it has been talked on board ship that it was foul; but I have no proof of it, and I could not say much about it. There were those that rejoiced in his death.

Question. Who rejoiced in his death?

Answer. Captain Buddington.

Question. Did anybody else?

Answer. I thought it relieved some of the scientific party of some anxiety. They did not mourn him, at least. I know Captain Buddington so expressed himself, that he was relieved of a great load by the death of Captain Hall.

Question. Why?

Answer. I do not know; I never asked him. He was too strict for him, I suppose.

Question. Did Captain Hall do anything to interfere with the work of the scientific men?

Answer. I believe Captain Hall was not allowing them to take all the advantages they thought he should.

Question. In what way?

Answer. They could tell better than I can. He wanted them to do as he said; and they wanted to do as they pleased. He wanted them to do their work in his way; and they wanted to do it in their own way. It referred to what they were doing, and not to absence from the ship. I do not think Mr. Bryan was included in this; I know that Mr. Meyer had some trouble with him on that score. He wished to do his work in his own way, and probably it was the best; and Captain Hall wished to have him do it in his. It was settled, I believe, so that Meyer did it in his own way.

Question. Did you know any difficulty between Captain Hall and Dr. Bessels?

Answer. Nothing serious; nothing serious between any of the scientific department and the captain, that I know of.

Question. Do you know of any request that any of them made of him, that he positively refused to allow them to do?

Answer. No, sir; I believe not. These are things I am not very well posted in.

Question. With whom were you most intimate on board the ship?

Answer. Not with many; the most intimate ones were Mr. Bryan, and the mate, Chester. I have already given my opinion of Mr. Chester. I think him a good man under a good commander. Mr. Bryan was a very fine young man. He was a general favorite; at least I thought so; he was my favorite.

Question. Did he have any difficulty about the way he did his work?

Answer. I believe not; I believe he had no difficulty with Captain Hall whatever.

Question. You did not think there was any difficulty between Captain Hall and any of the scientific party, that would be an inducement for them to do anything toward injuring him?

Answer. No, sir; I did not think so then; and unless a man were a monster he could not do any such thing as that. He had not sufficient provocation; and no provocation should induce a man to do such a thing.

Question. When Captain Buddington told you that he was very much relieved by Captain Hall's death, what did you understand to be the reason?

Answer. I think Captain Hall was too strict for him; and if Captain Hall had lived he would have continued on northward, and Captain Buddington knew it. He did not wish to go any farther north, and so Captain Hall's death was a relief on the part of Captain Buddington. He did not give his reasons; I did not ask him. I did not hear anybody else say he felt relieved by it.

Question. Did Captain Buddington make these remarks to you alone?

Answer. He made them publicly, on board the ship. I think it was to some of the people who are here. He is a careless-spoken man, and he certainly should not have made any such remarks. Perhaps he did not mean all he said; I hope he did not.

Examination of Frederick Meyer.

FRIDAY, *June* 6, 1873—2. 10 p. m.

The SECRETARY. Mr. Meyer, we have come together here for the purpose of getting the regular statements of all of the rescued party of the Polaris, expedition since it left Disco. We want your own statement in your own way; your own impressions, your own ideas, your own recollections, uncolored by other people's ideas. This is a matter of interest to a good many people on account of their personal knowledge of those who are rescued or those who are left behind. It is also a matter of great interest to the Government in view of its past and future action, and to science, in that it adds to the knowledge of the scientific world. Therefore, I desire your statement as carefully made as possible, and as fully as you can recall the circumstances.

Answer. My name is Frederick Meyer. I am a native of Prussia. I have been in this country since 1864—nine years. I am an observer in the signal-service. I was appointed meteorologist on the Polaris expedition, and detailed by the signal-service to take that position. I joined the expedition at the Brooklyn navy-yard. I joined the ship the day before she sailed. The Polaris started on the 29th of June, 1871. She left New York Harbor for New London, Connecticut, and arrived there at 12 o'clock noon the next day, the 30th. As I understood, Captain Hall intended to procure a second engineer there. We left New London on the 3d of July for the coast of Greenland, and arrived at Fiskernaes, on the coast of Greenland—I forget the exact date. The Polaris went in there because Captain Hall wanted to procure Hans as a hunter and dog-driver, but he got information there that Hans had removed to Proven, farther north, between Tessiusak and Upernavik. We started from Fiskernaes, and went into Holsteinburg with the intention to procure deer-skins, but it was found that all the deer had left there some years since, and that no deer-skins could be got. From Holsteinburg we started for Godhaven, on the island of Disco, where the vessel was to wait for the supplies by the Congress. There we were delayed one week, when the Congress camew ith provisions and coal. Two or three days after the arrival of the Congress we started again, with the inten-

tion to call in at Upernavik, where the inspector of the northern district of Greenland resides—Inspector Smith—who thought that Captain Hall could procure some seal and dog skins there. We got quite a number of these skins, and then proceeded from there to Tessiusak. This is in latitude 73° 24′. There is a large bay there, and a number of islands in front of it. On one of the islands is the small settlement of Tessiusak. Upernavik is in latitude 72° 53′. I made the observations myself. Tessiusak is between Upernavik and Devil's Thumb. There is a large bay there, and a glacier in the background, and many icebergs. It is marked on Arrowsmith's map about where Sugar-Loaf Island is. There are only a few native huts there, built of stone and earth, roughly put together, and one wooden house for the governor. The governor is the local magistrate. There are two inspectors for Greenland, one for the northern and one for the southern district; the one for the northern at Godhaven, Disco, and the other at Juliensshaab. We called into Tessiusak with the intention to send a boat over to Proven to get Hans and procure more skins and dogs. That is south of Tessiusak about twenty-five miles. Tessiusak is not on the admiralty chart. Captain Hall procured a number of dogs at Tessiusak; also skins and ready-made skin clothing. A boat was sent off, under the command of the mate, H. C. Chester, with an order from the governor at Upernavik, which told the governor at Proven if possible to let Hans come with the expedition. The boat returned with Hans and family, his wife and three children. We started from Tessiusak on the 24th of August, or the 26th, I am not quite certain. We crossed Melville Bay in foggy, misty weather at the commencement; but it soon cleared up, and the vessel was enabled to bring Cape York in sight on the second morning. Leaving Cape York on the starboard bow, we proceeded on, with the intention to land at Cape Dudley Digges, which the orders required, and deposit a record there. But on passing there Captain Hall found too much ice accumulated, so that he could not land. We proceeded farther on, between Wolstenholm Island and Cape Athol, and went close by the coast, within about five miles of Cape Parry. From Cape Parry we steered farther west, so as to get clear of the shore-ice and land-ice, and then started our course due north again until we came to Cape Alexander. From Cape Alexander we ran up along the east coast, and proceeded by Port Foulke, Kane's winter quarters, and then struck right across Smith's Land, passing by Henry Island and Bache Island, and reached nearest the west coast, about ten miles from Cape Hawks. From that point the Polaris steered more to the eastward, and ran along the coast, passing by Cape Napoleon, Point Joy, Cape Hayes, until finally we came very close to Cape Frazer. At Cape Frazer there is a small inlet. Captain Hall had the vessel stopped, and, with Captain Tyson, he proceeded in a boat into this small inlet, to see whether it would be a suitable place for a depot of provisions and coal, and to see whether, perhaps, it would be suitable for a winter harbor. They returned, and he said then the water was too shallow for a winter harbor, and no depot was made there, and no record was put there. We then went along the coast, passing by Cape Barrow. I forgot to say that at Cape Hawks we met a large pack, and had to steer around it to the south, and came around to the westward of it. We also encountered ice at Fitz Clarence Rock. There we met the first ice, but pushed right through. It was only a small patch of ice. After we passed by Cape Frazer there was more or less ice always seen; but there was no difficulty in getting through it. In this way we kept along the coast. This coast, (referring to the chart,) is entirely different from what is here laid down on Dr. Hayes's map. In the first place, Cape

Constitution is farther south, in about 80° 27′. The channel narrows very much at Cape Constitution. Besides these two islands, which are right opposite to Cape Constitution, there is another island nearer the west coast. The channel there is very narrow, perhaps only fourteen or fifteen miles wide. Between this and the westernmost island and the west coast is where we pushed through in going up with the Polaris. There was a small stream of water there. They tried to push through in several places, until finally they found this one place. The channel being very narrow, the ice had all accumulated there. Carl Ritter Bay is a great deal farther south than it is put down here. The coast-line all along here is entirely different from what is laid down. I could only say that Cape Union and Cape Lieber are correct. The entire coast-line comes farther south; there is a part of it left out altogether on this map. After we passed Cape Constitution the course of the vessel was turned to the eastward, and observations were made by all that were able to do so, in latitude 81° 24′. At 9 o'clock in the morning the observations were made for longitude, and at 12 o'clock, noon, for latitude. The longitude was found to be 64° 35′, if I recollect right. From Cape Constitution it widens out a great deal in both directions; but especially to the eastward, where it forms a large bay, which was named by Captain Hall Polaris Bay. That was what was supposed to be a sea—Kane's Open Polar Sea. I can understand why Morton did not see to the east side; because these islands are right in front of Cape Constitution, and he did not go on top of the cape. He staid below on the ice, and in that position the two islands will entirely cover the east coast, so that he could not see that at all. So what has been called Kane's Open Polar Sea was found to be a sound of about the same formation as Smith's Sound, only the glacier in the background, is not so large. The east side of this was named Polaris Bay. From the point where the observations had been made the Polaris followed the east coast until she came to another narrows, the southern cape of which is called Cape Lupton, in latitude 81° 44′, after Major Lupton, of this city, Captain Hall's friend. There a new channel commences, which was named by Captain Hall Robeson's Channel, after the Secretary of the Navy. That channel is about twenty-five miles wide at the beginning. Entering this channel, the Polaris followed a northerly course until she encountered ice in latitude 82° 16′. The channel was not entirely clear before we encountered the ice, but it was so that the ship could steam through without difficulty. There the Polaris was fastened to the floe, and a record was made out of the proceedings of the expedition, inclosed in a copper cylinder, and thrown overboard. That was the first of the copper cylinders thrown over, and which contained a record up to that time. I have seen the record, which gave the proceedings of the expedition to that date, the latitude and longitude we were in at the time, and, besides it said there was a fair prospect of going farther. Before the observations were made Captain Hall thought we were a great deal higher than we actually were; he thought we were in about latitude 84°; but the observations proved that it was not so. At this point, where we met the ice in Robeson's Channel, no observations were taken. Captain Hall ordered me to make up the dead-reckoning from the log. The latitude and longitude, which were put on the record, was such as was found from the dead-reckoning, starting from the last observation, 81° 24′. That is, only those portions of the log, referring from 12 o'clock, noon, that day, until we reached latitude 82° 16′, were used. We had been steaming from noon until the time when we met the ice; I am not certain about the hour. We were

fastened to this piece of ice a few hours, and then started eastward, intending to make a harbor and reach the east coast at a small inlet, which was afterward named by Captain Hall Repulse Harbor. It is to the southward of east of the point where we fastened to the floe. I made observations on the shore. The latitude of Repulse Harbor is 82° 9′. Captain Hall and Captain Tyson ran in there in a boat; but they found such a tide that they thought it would not answer for a harbor, and came back to the vessel. We then started north, with the intention to try once more whether we could push through the ice with the vessel. We went two or three miles, and found we could not. We never got as far north as latitude 82° 16′ again. When Captain Hall found we could not push through the ice, he went to the westward, and fastened to another floe, and staid there over night, and the next morning returned to Repulse Harbor to examine it once more. But he came to the conclusion, the same as before, that he could not harbor there during the winter. So he once more tried to push farther north through the ice; but when it was found that he could not get through, he called a council of the officers, asking each officer's opinion whether to go farther north or make a harbor, or what to do. All of the officers were of the opinion to start toward the west coast, to see if they could find a lead to the northward, and if they could not make a lead to the northward to make a harbor on the west coast. I say all the officers were of the opinion except Captain Buddington. His opinion was to go into this Repulse Harbor; or, if Captain Hall did not think fit to go into harbor there, to make a harbor farther south. And the harbor he intended to go in is about latitude 80° 1′; it is called a fjord. There is an island right in the center of it, and behind this island he intended to harbor. I think it may be a strait and not a fjord. Then, as a majority of the officers had given an opinion to go westward and try for a lead northwest, Captain Hall concluded to do so. The Polaris was then started on a westerly course, went along slowly, pushing through the ice, perhaps one or two knots an hour, losing ground in latitude, till, finally, a fog shut in and heavy ice was encountered. The Polaris was then fastened to a floe, and soon was closed in by a heavy pack. On this floe she laid for four days. During this time she drifted to the southward thirty-six miles. The following winter, while in winter quarters, I constructed the track of the ship during the voyage. Latitude 81° 38′ was one point to calculate from, and where we fastened to the floe was the other. Then going back to where we broke out of the ice, gave me the points of the drift, and thus I got the distance. We drifted toward the southwest. After the expiration of these four days, the vessel got clear of the ice, and steam was got up, and the vessel was started with the intention to make harbor without losing any more ground. So the vessel was taken on an easterly course, till she arrived in latitude 81° 38′, longitude 61° 44′, on the 4th of September, I think. This is part of Polaris Bay, and is a smaller inlet in this bay, and was named by Captain Hall "Thank God Harbor." It is on the east coast. When we arrived there, Captain Hall thought of making winter quarters there. "Thank God Harbor" is not a very deep inlet; it is only a very shallow bight, and not very well protected. The principal protection we had was a large iceberg, which had a name given it by Captain Hall. He called it Providence Iceberg. This was the principal protection against the ice. Captain Hall proceeded to get out the provisions, and to establish a depot ashore at the same place. An observatory was erected there, and very soon after Captain Hall started on his

sledge journey. I had plenty of opportunities for verifying the position, observations being made during the whole winter. It is exact to the minute. The object of Captain Hall's journey was to find whether an overland route would be practicable, so as to be ready in the spring to start on such a route. He staid away two weeks, in company with the mate, H. C. Chester, and Joe. Captain Hall went to a bay farther north, which he named Newman's Bay—a very deep bay. They killed one musk-ox. The entrance to Newman's Bay is about eight or nine miles wide; it is farther north than Polaris Bay, and enters into Robeson Channel. The southern cape of the bay is in latitude 81° 55′, and the northern one in 82° 2′. We had no means of determining the highest point that the Polaris reached except by dead reckoning. The highest point where I took observations was some time afterward, when I was at Newman's Bay, and went on the shore to Repulse Harbor. The highest point on land was here in latitute 82° 9′. It was as correct as I could get it. The position I was on was a hill 1,700 feet high. Of course the dip was about forty-five minutes. Besides I had no artificial horizon except a kind of mixture of ice-horizon and sea horizon.

Question. What was the latitude of the observation the day you took it at noon—the point from which you started your dead reckoning?

Answer. 81° 24′.

Question. Then you ran forty-two miles north to get to 82° 16′; how long were you in doing it?

Answer. I cannot be precise about the time when we stopped; I am not at all certain about the hour. That we were farther north than Newman's Bay, in the ship, is proved by the fact that we saw that bay when we passed up, going farther north. Newman's Bay was south and east of us when we were at our highest point in the Polaris. The northern cape of Newman's Bay is in 82° 2′; Repulse Harbor is 82° 9′. We went into that twice; and at the same place I have made actual observations myself. The highest observation that I made was at Repulse Harbor itself; it is steep on both sides, and I made my observation on the north side; that is the highest actual observation I made, and that was southeast of the highest point made by the ship; I know that by the log, or the dead reckoning.

Question. When you were up at that highest point, you know that you passed Repulse Harbor?

Answer. By the dead reckoning we knew what course we steered from the highest point to get to Repulse Bay, and that was to the southward and eastward. There could be no mistake about it, for there was a northern current; the current and the sweep carried us southward, and there could be no mistake in the reckoning on account of current. When Captain Hall returned to the ship after his sledge journey, he complained about sickness in the bowels, and went to bed. He complained as soon as he came home. The next day he was found paralyzed on the left side; he remained in this state for three days; then he got the use of his limbs again, and got a little better. Soon afterward he became delirious, and remained so, more or less, till he died; he died two weeks after his return. The physician on board stated that it was a case of apoplexy. As I understand, it was apoplexy from the first; he was paralyzed three days, I know, from actual observation. He died, and was buried on the shore southeast of the anchorage of the ship about half a mile, and a small flag was set up to mark the place of interment. At the time nothing else could be put up. The ground was frozen solid, and it was with great difficulty they could dig

into the ground; so the place was only marked with a small flag at the time, with the intention to replace it by a board as soon as the summer set in. That was done afterwards.

Question. How soon did you see Captain Hall after he returned from his sledge journey?

Answer. The shore there is very low, and we could see from the observatory to the ship, and could see any person coming from the ship to the observatory, or going to the ship. We saw Captain Hall and party returning, and I met him half way between the observatory and the ship. I had some conversation with him. I do not know whether anybody was with him then. I believe Captain Tyson, but I am not certain. Somebody was with him, but I could not say who it was. The conversation was such as is usual. I asked him how he felt, and I was very happy to see him back. He told me at the time that he felt very well. Soon afterward I came back to the ship, and I found Mr. Morton busy in getting Captain Hall to bed. He had already complained about being sick, and while I was there he went to bed. I then returned to the observatory again. We had regular watches then, and my watch commenced. I only heard he was sick at his bowels when I came on board. Every time I came on board ship I saw him, because I lived in the same cabin. Dr. Bessels and the engineer, Schumann, and the steward and cook slept there also. I had only one conversation with Captain Hall while he was sick. That was after he became delirious. During the time that he was delirious, he had the idea that somebody intended to murder him, and he accused in his delirious talk one person after another of having such intention. I was very busy most of the time, because Dr. Bessels had to stay on board and attend to Captain Hall, and so I had the whole labor at the observatory on myself. Mr. Bryan only attended to the astronomical observations. Captain Hall called me to his bedside, and said that he knew that some persons on board the ship intended to kill him, and he wanted me to stand by his side. He did not mention any name at that time, but at different times he mentioned most of the persons on board. He was insensible the first three days he was sick, which I think was caused by paralysis, and he did not speak for the last twenty-four hours either before he died, as I understood. The only conversation I ever had with him after he was sick was what I have stated. He did not mention any names then.

Question. Did you at any time hear him accuse anybody of an intention to murder him?

Answer. Yes, sir. When I was about the cabin I could hear him. Some person might be attending to him, sitting by his side, and he would be talking very pleasantly, and all of a sudden he would say: "What is this; what is this blue smoke; and what is that there, all blue?" He thought it was poisonous vapors, he said.

Question. Did you ever hear him accuse anybody to other people? When one was sitting by him would he speak of other people?

Answer. Yes, sir. He would accuse other people, and ask the protection of the man sitting by his side. He accused Mr. Chester and Captain Buddington—those were the two principal ones—and Dr. Bessels.

Question. Then, when these persons were sitting by him, did he ask them to protect him?

Answer. Yes, sir. I was under the impression that he accused most everybody, but those are the only ones whom I recall.

Question. When talking with Chester, for instance, would he accuse anybody else?

Answer. Yes, sir; he would accuse Captain Buddington.

Question. Did you hear him talk to Dr. Bessels?

Answer. Yes, sir.

Question. When talking to him, did you hear him accuse anybody else, and ask the doctor to stand by him?

Answer. I do not remember that I heard him appeal to the doctor to stand by him. He seemed to accuse anybody.

Question. Was he under regular treatment?

Answer. Yes, sir.

Question. Do you know what remedies were given him?

Answer. He gave him a great many; hypodermic injections of quinine, I believe, for one. For three days he partially recovered.

Question. Who were his attendants?

Answer. Dr. Bessels staid with him most always, and then he had a man by the name of Mauch, who acted as private secretary to Captain Hall. He was with him most always. When he was so delirious that he thought some person had the intention to murder him, he had Mauch to taste everything that came into the cabin—medicine and food, even the water he drank.

Question. When he got better did he recover his senses?

Answer. No, sir, not fully; but partially.

Question. Did he get up about the cabin and write?

Answer. He never wrote that I know; he had Mauch read to him.

Question. Did he dictate to Mauch to write?

Answer. No, sir; he did not do any work; I think he had Mauch read to him, and sometimes he would start to take an interest in some business matter, and would give it up again before he got through. During the time that he was partially recovered, he had the intention to give up the command of the vessel to Captain Buddington. That is, he called him into the cabin, and told him he would give up the command to him; that he would have the papers made out immediately; but he did not do it. I heard Captain Hall say this.

Question. Was he taken suddenly sick again after getting better?

Answer. He began to become more delirious, and to show the desire of staying in the bed. He remained in this state until he died. That is, I was told that for the twenty-four hours before he died he did not speak a word to anybody. He very often had Joe and Hannah called to his bedside to attend to him. At times he would labor under the impression that all the people on board the vessel intended to murder him, and he would call for Joe and Hannah, and have them sit by him. When he got tired of them he would have somebody else. I think he was better about three days. I was in the observatory when he died. He died in the night. It was on the 8th of November, 1871. It was dark continually then, and only twilight at noon. Services were read by Mr. Bryan, who acted as chaplain. After Captain Hall died, Captain Buddington took charge of the vessel. The intention then was that the instructions should be carried out; those directed that Captain Buddington should take charge of the vessel.

Question. What was done with Captain Hall's papers?

Answer. They were taken charge of by Captain Buddington. There was no public examination of them. I have seen the outside of the papers many times, and have seen Captain Buddington looking at them. He had them in a large tin box. As I understand, there are a few private papers in the possession of Joe and Hannah at present, but all the

official papers were in this large tin box. He had a writing-desk, private papers therein, and Joe and Hannah, when they were started out on the ice, we found had possession of the writing-desk of Captain Hall. There was no official action nor public examination of Captain Hall's papers, but they went into Captain Buddington's possession. I have never read them. I wrote the first six or seven pages of Captain Hall's journal. That is all I know about it. That part consisted of the voyage of the ship. After Captain Buddington went into command, the vessel was hauled up, and we commenced a regular series of observations on shore, until, on the 22d or 24th of November, the ship broke out in a heavy northeast gale, and drifted in the darkness on to Providence Iceberg. If that had not been in the way, the ship would probably have drifted during the winter; but it was brought up on the iceberg. Then, in the darkness and heavy snow-storm, the vessel was fastened to the iceberg, and it remained there during the winter. The iceberg was to the southwest of the vessel. The prevailing winds were from the northeast. In the spring the first journeys were made by the natives out on the plain to the southeast of the observatory. There is a large plain, leading southeast and northwest. They went out to procure fresh meat, and they were very successful. They went to Newman's Bay, and across on the other side they found a great many musk-oxen, and they killed as many as they could carry and bring back to the ship. Newman's Bay opens north of Thank God Harbor, but stretches to the southeast. Then there was an expedition went to the southwest. At the southern end of Polaris Bay there is a fiord, which we called at the time the "southern fiord." Dr. Bessels, and Mr. Bryan, and Joe started on an expedition to this fiord, and from there they started across toward the projecting cape of the channel, and which was then supposed to be Cape Constitution; but it afterward proved not to be so, but to be a point not known before. Cape Constitution was found to be a great deal farther south. They returned without finding Cape Constitution, not going so far. The fiord runs to the southeast; latitude 81° 11′ is the eastern limit of it. Dr. Bessels, Bryan, and Joe went down and crossed the fiord, which is about twenty-two miles wide; and then they went along the coast about forty miles without reaching Cape Constitution. They saw the island that lies off that cape. The next journey was made with the double intention of getting fresh meat, and of traveling on land the other side of Newman's Bay. I went in charge of one sledge, and Captain Tyson in charge of the other. I was very busy in making surveys up the coast; I wanted to survey the west of Newman's Bay, and to make surveys in the interior, and, as long as provisions would last, to go as far as I could. I then went out to the mouth of Newman's Bay, made the surveys of Newman's Bay and the surveys of the west coast; and went to the glacier at the end of Newman's Bay, and made surveys there. I then started across Newman's Bay, and made surveys in the interior; but kept on traveling to the northeast until want of provisions compelled us to return. Captain Tyson was with me when we went into the interior. I made calculations of the farthest point north; I did not get any farther than 82° 9′. That was the highest point I reached. That was in May, 1872. After I returned from this sledge journey I remained at Thank God Harbor until the first part of June, when two boats were started to the northward, for the purpose of pushing as far north as possible. One boat was under the command of the mate, H. C. Chester, and I accompanied him; and the other boat was under the command of Captain Tyson, and Dr. Bessels accompanied him.

The boats were carried on sleds to Cape Lupton, the southern cape of Robeson Channel, on the ice. It was the intention to start from there by water. As soon as our boat got there, Mr. Chester wished to start right off; and taking advantage of a lead, and pushing over the ice, carrying the boat on the keel, we proceeded about three or four miles, and encamped for the night on a small piece of ice, which appeared to me to be very unsafe, as it was right against an iceberg, and very thin. A watch was set out, and we went to sleep. In the morning Mr. Chester and myself were sleeping together between two skins, and were called out by the watch, and told that the iceberg alongside of us had commenced to move, and that the piece we were on was also moving. Before we could look around much, the piece of ice that the boat was on broke in two pieces, with the boat on one piece and the anchorage on the other. The crew was with the boat, and Mr. Chester and myself were on the other piece, where the anchorage was. The anchorage was loosened right off; that is, the rope was cut, and the boat, with the crew, drifted away from us. The iceberg came, and pressed upon the piece of ice on which the boat was, and piled up the ice against it, and the boat was in danger of being crushed. The ice came up against the piece that Mr. Chester and I were on, and rose up and threatened to fall on us, but did not. But where the boat was, a large piece of ice was erected right straight up, and came down on the boat and crushed it. The crew jumped up on the piece and saved themselves. And then Mr. Chester and myself got on to the shore-ice and saved ourselves. We saved what we could of the clothing, instruments, and provisions that were on the boat, and then returned to the ship. We found Captain Tyson at Cape Lupton; he had not started from there. Mr. Chester procured another boat, the canvas boat, and started with this new English canvas boat a few days afterward. We sledded the canvas boat up to Cape Lupton, and waited there for a chance for a lead. Captain Tyson had then gone when we reached there. We soon got a lead, but only got four or five miles farther north at the time, and had to lie up to the shore-ice a number of times; and finally got on a drifting floe, and were in danger of being drifted off on it, without being able to reach the shore. The small ice closed in around the floe, but finally the "pash" ice loosened, and we got the canvas boat into the water, and in one day rowed up to Newman's Bay, distant about twenty miles. There, at Newman's Bay, the ice was found too compact for any boat to push through. But we found Captain Tyson there on the bay ice. Several starts were made on the bay ice to get farther north; but we never got any farther than about one or two miles. We were in Newman's Bay over a month, when Captain Buddington sent orders to us to return. The boats were then dragged ashore on their keels and left there. The crew and men returned overland to the westward. The ice had closed in behind us. We got back some time in July. Some of our crew had been to the ship for provisions, and when they returned they told us that she broke out some time in June, and was in a leaky condition, and that was the reason why Captain Buddington sent orders for the two boats to return. It was two of Mr. Chester's boat's crew who went to the ship to get more provisions; and when they returned with the provisions, they brought a written order to return; and they told us the ship was in a leaky condition. The leak was in the stem of the vessel, which had been strained, as the ship had been on the foot of the iceberg, and hanging over to one side. That strained the stem and started the skin of the bows on both sides. When we returned they were pumping the ship by steam; but after-

ward it was found she could be kept free by a small hand-pump, one of those that they cleaned the deck with. They had to keep the hand-pump going continually to keep her free; but there was a large ship-pump on board. We pumped with the ship's pump after the steam-pump had been stopped; and, if I recollect right, it was five minutes out of the hour that we had to pump. While we were at Newman's Bay Captain Buddington made several trials to get up there with the ship, but he never succeeded. I suppose this was with the intention of getting farther north if he could.

Question. Do you suppose that, if the way had been open, he would have tried to reach a higher latitude?

Answer. Yes, sir; if there had been no ice he would have gone.

Question. Did he seem interested in trying to go northward after Captain Hall's death?

Answer. He seemed to be changeable; sometimes very much interested in going north, and sometimes he would not be. Captain Buddington told us it was his intention to return on the first opportunity, as soon as he got a lead of water. This he got on the 12th of August, and started, and kept on steaming till he got to the small island on the west coast, opposite Cape Constitution. There he encountered ice, fastened to the ice, and drifted for a night, and then steamed again a short time. He started right out to the westward of Polaris Bay, and passed what we called the southern fiord, and went into Kennedy Channel. It was his intention at the time to make the west shore as soon as possible, so as to proceed on the west shore, because he thought that the only chance of finding open water would be on the west side. He got several chances to steam after he fastened to the floe; until finally we had to fasten to a floe in latitude 80° 1′.

Question. Did you ever know of Captain Buddington's being drunk on board ship?

Answer. Yes, sir; he was drunk most always while we were going to the southward. I do not remember whether he was drunk when we got beset with this last floe. There was only alcohol on board, and he would brew beverages out of the alcohol; it was in the hold, and he had free access to it. I do not know what he made of it; all that I know is that he used this alcohol; that is, I heard of it. It was very common with him, whenever there was any danger, that he would like to drink.

Question. Did anybody else on board the ship have liquor, that you know of?

Answer. I do not know of anybody else being drunk.

We kept on drifting with the ice until we passed Rensselaer Harbor, opposite Hayes's winter-quarters, until one evening, on the 15th of October, 1872, in a heavy south and southeast gale, and a snow-storm and snow-drift, the ice parted, and two icebergs entered into the crack, which passed right along toward the ship, pushing that part of the floe to which the ship was attached toward the shore, and the ship was with it. When the two icebergs had passed through the crack, the ice closed in again, and pressed heavily against the side of the vessel; and the pressure was so great that the ship was raised up about six feet. The timbers and skin were cracking, and the orders were given to heave the provisions and clothing overboard on to the ice; they had been kept on deck for that purpose. Coal was also prepared in sacks and kept on deck for the purpose. All was thrown overboard in wild confusion. This was in the night-time, with snow-storm and heavy gale. Part of the crew had to go out and collect the coal, provisions, and

clothing, and carry it up farther on to the ice, so as to save it in case the ice should break up; but before the collection could be made the ice all broke up, and when the ship was relieved the broken pieces drifted off, and the stern-line parted, and the bow-line slipped off the anchor, so that the ship, and the piece on which the provisions were, drifted off, and the men who were on the ice had to stay there, and had only time to pull the two boats, which were on the ice, over the crack, so as to get them together with the men and the crew. The ship disappeared; it was very dark, and the snow drifted, so that one could not see more than ten or twenty yards. All we found preserved was eleven boxes of bread, about four hundred or five hundred pounds of pemmican, and some preserved meats, (several dozen cans,) and fourteen hams, I believe. I was on a broken piece of ice, with two other men, and the small scow was on that piece. We just had time to pick up the things and get into the scow, and we only had a kaiak besides, and when we got over the scow was full of water. Then they started the scow back for some other men on the same piece. When they got over to them the scow was so full of water that she sunk, and they could not bail her out, and they had to send one of the boats to get the men. It was all in the darkness, but finally they succeeded in getting all together. There was nobody lost three.

Question. How do you know; did you know who were on the ice?

Answer. Everybody known to be on the ice was there; besides, if we could not see them, they could make themselves heard. All my papers were in a box which was thrown out on the ice, and so were Mr. Bryan's; and they were lost, going off on some broken pieces. They may have been picked up afterward by the Polaris; we have not got them. Dr. Bessels kept his papers on board, so that they will be on board when she returns. I was on board about five minutes before the ice broke. Then I saw Captain Hall's papers in the cabin; so that they are, very likely, on board. I did not see the journal. The tin box was standing on the table and the papers were lying alongside of it.

Question. What was the condition of the ship when she went off?

Answer. I had labored under the impression that she was sinking. I met Captain Buddington several times while they were heaving the stuff out, and from all that I could learn from him, I understood that she was in a very bad condition, and might be expected to sink. He was sober then. After I got on the ice I was told by other persons, for instance, by Captain Tyson and the steward, that they found, before they went on the ice, that the ship was not making any more water than before. The ice kept breaking up on the edge of the floe, and we had to remove our provisions a number of times, until finally, at 12 o'clock, midnight, we were perfectly exhausted, and we lay down and fell asleep there. Captain Tyson was the senior officer left on the ice. Next morning we found we were close to the shore; that the floe brought up near the shore. There were two islands right close by; one Northumberland and the other McGary's Island. I knew it, because I had been making observations every day or night, there being twilight only. I cannot tell how late the observations were made up to, but it was a day or two before we broke up. We had sighted Northumberland Island the day before. Then there was a lead of water, which seemed to lead right in to the shore the next morning, and Captain Tyson concluded to start two boats in toward the island. We got the boats out and went into the lead, and were closed in by the ice, so that we could not reach the shore. We then pulled up on the ice, and while we were there, on the ice, the ship was seen coming down under steam and sail toward the

islands. We lost her out of sight behind this island. I saw her coming down and saw her disappear behind the island. They say she went into harbor between Northumberland Island and the shore. She must have come within about four or five miles of us, because we could see every sail. She had all sails on; we could see the hull. She was end on to us, coming toward us apparently.

Question. Did she look as if there were anything special the matter with her?

Answer. No, sir. I do not think she could have been in any worse condition, because, when we got away from the ship, the engine and pipes and wells were frozen up solid, so that it would take them at least ten or twelve hours to get the engine going. So, if she had been in a much worse condition, they could not have kept her up. They could not have used anything but hand-pumps until they could get the steam, and they could not get that in less than ten or twelve hours. I could not see anybody on board. The ice between us and her was principally small ice. She was in clear water, not in any ice at all. The boat-mast was erected, and a rubber blanket fastened to it, with the black side toward the ship.

Question. Could your two boats be seen?

Answer. I think so. Afterward I had an opportunity to see the men and one boat a distance of about half a mile. I thought at the time it was a very large object to see; it is very distinguishable on the ice.

Question. As you stood on the ice was the sky and land behind you or the ice?

Answer. Ice. We expected them to come, and did not give up the hope until we saw that we were drifting off, and they did not come yet. We did not see any hinderance whatever. I at the time thought there must be something the matter with the ship, or they would have come. The ice between us and the shore was the small "pash" ice, that a vessel can very easily steam through; a boat could not get through it—it would be stove in. I have seen the Tigress going through worse ice after we got on board of her. We had been in worse ice in the Polaris. Captain Buddington had the trial of going through much worse ice once, but did not succeed very well. I did not see the ship after she went into the harbor. The reason I did not see her was that I did not have any glass at hand, and I could not see her with the naked eye; it was getting very dark. That was the next day after we separated, in the afternoon. After I was told she had gone into harbor, Captain Tyson started with one boat and crew, carrying her on the keel, with the intention of trying to get across the floe and get ashore. He got across the floe, and got the boat into the water, and proceeded toward shore, when the ice closed in, and the boat returned to the floe. This closing in of the ice was caused by a northerly gale setting in, and the drift is off-shore very fast in such a gale. The next morning we found ourselves in the middle of the strait, and without the piece of ice that the other boat was on. So we lost the canvas tent and some six bags of bread. We had strong winds, sometimes southerly and sometimes northerly, principally the latter, and during that time we drifted to a point between Northumberland Island and Wolstenholm Island. We had the latter in sight two or three days part of the time. From Wolstenholm Island we were carried right off to the westward until we got to the middle of the strait, and then we drifted down until we got opposite Cape York. We then drifted to the west, and got in sight of the southern portion of Lancaster Sound. We then went to the eastward again, so that we had no land in sight whatever, drifting along, perhaps in the middle of the strait, until, in the early part of January, we reached Cape Walsingham. I do

not remember the time; I have a record of that. I kept a record on the ice. Cape Walsingham is in latitude 65° 45′, about 12° from where we left the ship. We then lost sight of land again, and did not see land any more until we sighted some part of the Labrador coast in March; my record will show. While off near Dalrymple Island we sighted the floe that the canvas tent and the boat were on. We started across the ice and got the boat, and got the bread in the canvas tent, and carried them across to our encampment. We started several times for the canvas tent, and got the timber, and carried that across also. Afterward we started back to the same piece where we got the tent, with the intention to make land; but when we got on to the piece the night set in, and in the morning we found the water between us and the old floe, but we got back to it. The floe we were on, before it was broken up, might have been five miles in circumference. We were off from it for a time, and then got back to it, with both boats aud all the provisions. The surface of the floe was hillocks and fresh-water lakes. If the Polaris had not broken away from the floe, she would most likely have floated as we did, but she would have had an opportunity to leave the floe, and steam. I think that even on the following day, after we got on the ice, there was a great lead of water to the southward, and if the Polaris had been there at the time, she might, perhaps, have rounded Cape York and got down to Tessiusak.

Question. Will she be likely to have wintered where you saw her last?

Answer. Yes, sir, most decidedly. There is a settlement of Esquimaux at Netlick, about twenty miles farther south, on the same sound. They could go over to the village, and, undoubtedly, the Esquimaux would have continual communication with them. When we found ourselves on a small portion of the floe, the first thing was to make an estimate of the provisions and what could be used daily, in order to live through the winter. We saw that we could not get from the ice, and even if we got ashore we must live on the provisions we had on hand for the winter-months. It was found that eleven or twelve ounces per man would keep us five months, provided we did not get anything else; and it did last that. But at times we had to come to a smaller allowance—to nine ounces and seven ounces. That was before we got back on to the big floe. The next thing was to erect some snow-huts on this little floe. We erected one snow-hut for Hans's family, and one for Joe's family, and one for us; and there was an addition made afterward to the large one, where Captain Tyson and myself slept. That was on the small floe. While on this floe we sighted the boat and the canvas tent, and got them back to this piece, and afterward we started back for the larger piece, which was jammed in close by Dalrymple Island. We had not anything to make a station on the large ice, and tried to reach shore, but did not reach it, because the ice drifted out and left water between it and the shore, and also between it and the small piece of ice. On this large piece we staid till close on to the end of March. We erected snow-houses, one for the crew, one for Joe's family, one for Hans's family, and another was afterward erected for the crew, and the one first erected for them was used for a storeroom. We staid on this piece until the close of March. At the commencement Captain Tyson issued the provisions himself, by measuring the bread in his hand, and the pemmican also. At first, also, we got a few seals and had seal-meat and a few crumbs of bread. As soon as we had the snow-huts erected I made a scale. I had a very fine three-cornered rule and a balance. I made the weights. Some shot that

I had I made weights of, pounds and half-pounds, and down to two ounces. The provisions could be weighed out very accurately then. Soon after we got on the large piece again Captain Tyson was taken sick for a few days, and during that time some of the men took it in hand and issued provisions; and they always did it afterward, according to these weights. During the winter we succeeded in getting from five to eight seals a month on an average. Most of them were shot by Joe; some by Hans. At the commencement of March we succeeded in getting water-birds similar to ducks, only smaller. We got numbers of them for two or three days. We got a bear in the month of March; and during that month we got a great number of seals, so that we had enough meat in store to keep us for months. We had some provisions laid out on the ice, and the bear smelled them, and walked right up to the huts, so we killed him. During the month of March the ice broke up, and this large piece of ice that we were on broke up also, so that we were reduced to a very small piece, only about forty yards in diameter; and this still grew smaller by being washed out. So, finally, on the 1st of April, it was found necessary to start away from the piece, and proceed southerly, and especially westerly, so as to find any pack-ice, and keep from going to sea. We had but one boat, one having been burned up in the winter. The small allowance of food we had was warmed up, and the boat had been used for the purpose. From the 1st of April until the 30th we were continually on the move. Whenever an opportunity offered itself to take to the water, we did so, and tried to get farther to the southward and westward. When we started from the piece that we had wintered on, we had to leave all the meat. All we took was what we had left of the provisions taken from the ship, perhaps 100 pounds of bread and 45 pounds of pemmican. As long as we had water close by us, and while on the move, we could always get seals, and there was no fear of starvation. But about the middle of April, while on a piece of ice, we got beset with pash-ice, and had to stay there sixteen days, living on this bread and pemmican, and we were so much reduced that we were on the point of being out of food altogether, when we shot another bear. He was drifting over the pash-ice, which is much like snow in the water, but very deep and stout, with small pieces intermixed, so that you can jump from one piece to another. The bear was coming toward our piece of ice, and Joe had just gone out on a hummock to look out. He saw the bear, and we all lay down, so as not to be seen, and Joe and Hans went out behind a hummock, and fired into him and killed him. We all went out and fastened a line to him and got him safe on to our piece, and cut him up and stowed the meat away in bags. It was issued out at so much a man. This last bear we had was very tender; the first was tough. Musk-ox meat is very tough. A few days afterward the pash-ice opened, and we found another opportunity to get into the water and go to the westward. We kept on so for several days. By that time we had got so far south that the ice which we could pull up on was greatly wasted, and hardly fit for any person to stay on, and we were in continual danger of being washed off, if we tried to stay on it. Before we got into this pash-ice the boat got separated from the men one time. The ice was already not very safe, and we consequently had to keep watch and watch, half going to sleep and the other half watching. We had a small canvas tent and a boat; and about midnight, and during the watch that I was on, the piece of ice broke right between us and the boat. The general outcry was to stand by the boat. I did not see anybody else with me; I was alone. They had all staid by the canvas tent. They sung out to me to set the kyak

adrift, which they thought might perhaps drift toward them, and enable one of the natives to come over to me and help get the boat. I set the kyak adrift; but it went in an opposite direction. I tried to push off the boat, and got it over the edge of the ice, it being heavily loaded, when the two natives came out, paddling on a small piece of ice with the kiak paddles. I hove out the rope to them, and we three of us gave the boat a push into the water. I fell into the water then. We tried to get to the other piece where the canvas tent was; but we had not gone very far when the pash closed in upon us. We were fairly stuck there; but there was a small piece of ice close to us. We pulled the boat on to it, and staid there all night. In the morning, Captain Tyson and two or three men came across to assist us in dragging the boat back to the stores and to the canvas tent. It being night, we were in danger of being washed off the ice; and, in fact, I was overboard three times. It was a small piece of ice, and a very heavy swell in the sea. The sea washed large blocks of ice right over the piece that we were on, taking the legs from under us, and washing the boat and all the men from one side to the other. We staid there and held on to the boat from nine o'clock in the evening till seven o'clock in the morning, when we launched the boat, and got off on to a piece of ice, over which the sea did not wash very much.

I have here the notes, (kept in a note-book,) which consist of the notes which I made during our drift on the ice. I kept them from day to day, and every day when I had opportunity, on the ice. They will give a more detailed and correct account of what happened while we were on the ice than I gave you from memory yesterday. I remember one mistake that I did make yesterday, which was, that I said that we drifted past Cape Walsingham in January, whereas it was really later. The night when we were in the storm, when the sea washed over the ice, was from the 19th to the 20th of April. In the morning of April 20 we got the boat off this piece of ice, and arrived safely on another small piece, which was not so much subject to the sea washing over it. This was in latitude 53° 57′. (The observations were taken by sextant, ice-horizon, judging of the declination of the sun. I had no book of tables.) During this entire time we were wet through, all of us, and remained so until we got relieved by the Tigress, with no means of drying the clothing. The evening of April 20 a seal was seen on a piece of ice. Captain Tyson entered the boat with the crew, went after the seal, but did not succeed in getting him. During the entire month of April we had been in the habit of sleeping in turns, half of us sleeping in the boat, the other having the watch. April 21 I found the latitude to be 53° 57′. During the night, between the 21st and 22d, we had heavy snow, succeeded by heavy rain. On this day, (April 22,) in the evening, there were only ten pounds of biscuits left for the subsistence of the whole crew. Before the time came that we should take supper, a bear was seen, and shot in the way I have described yesterday, and by this means we got into possession of new provisions. April 23 and April 24 it had been raining. We were still on this piece of ice, which was about fifteen yards in diameter. It may have been, perhaps, nine or ten feet thick. The original floe, when we first got on to it, may have been about twenty or twenty-five feet thick. Where the hillocks are the ice is thick. There are sometimes holes in it and cracks, and it is washed out in places. While we were on board the ship we had very often holes made in the ice to ascertain its thickness. April 25 we had a heavy northeast gale, and a heavy swell in the sea.

Question. Could you sight land at all?

Answer. We sighted land several times. The ice opened, leaving a lead so that we could launch the boat. This was the first time we had one. By this ice opening, leaving a lead, this was the first stir we were enabled to make, after being inclosed by pash-ice for sixteen days. We hauled the boat on the ice again after eight hours' pull. The direction of our course was toward the westward. We didn't see any land yet. There was a great drove of seals seen, and some of them shot. The next day we made a new start; had to pull up on the ice again after an hour's pull. The keel of the boat was very much injured and had to be repaired. Some seals were shot that day also. I found the lead to be 53° 30′. Next day it was snowing thickly in the forenoon. A large amount of water was rising outside of us, but we could not get to it, and consequently could not stir in the boat. The following day we had a heavy west gale, the sea washing over the floe; we were compelled to stand by the boat, holding on to it so that it would not be washed over. At daylight, the 29th, the swell in the sea became so great that we had to leave the floe to launch the boat, and proceed by oar to the westward. We also tried the sail up, but the gale was so fierce that we came near getting smashed on a large hummock, so that we had to abandon the sail and take up the oars again. The wind changed to the westward. Pulled up the boat at 6 a. m. Launched the boat again at 1 p. m., and proceeded by her. Saw a great many seals and shot some of them, and on this day we also saw the first steamer. The steamer then was to the westward of us, and apparently crossing our course. The boat-mast was erected in the boat, and the flag hoisted up on it so as to draw the attention of the steamer to our boat. At dusk we lost the steamer out of sight. Pulled up on a piece of ice toward night, in the usual way, watch by watch. Fires were kept up, and seal-fat fires during the night. The piece of ice on which we were stopped last got smaller and smaller. These blubber-fires were kept up for the purpose of attracting the attention of the steamers if any should be in sight. We took a piece of canvas and soaked it in the blubber, and put a piece of blubber on the top of the canvas. We had plenty of matches. We preserved them in the copper cylinders which were intended for the records. They were wax matches. There was not a very large supply on board, but they were kept for sledge-journeys and such like occasions. The morning of April 29 was very fine and calm, and as soon as daylight broke we sighted the steamer again, a very large one, only about five miles off. Launched the boat at once and proceeded toward the westward, toward the steamer. After about two hours we encountered a close pack, and had to pull up on a piece of ice. We hoisted the flag on the mast, which was on a piece of ice about twenty feet high; also made another flag-staff by lashing two oars together, and tying to them a large blanket; also all the fire-arms we made use of by firing three times. Soon after we had fired three times we heard three shots from the steamer, taking this for a signal that they had heard us; another shot which was also fired was answered from the steamer. In taking these shots for signals from the steamer we must have been mistaken, for the steamer kept on cruising, and toward the evening steered to the southward and was lost. About dark on the night of April 29 we saw the Labrador coast; it appeared to be forty miles distant. Nights of April 29 to 30 fires were kept up, in order to attract the attention of steamers which might be around; but the fires were almost useless from midnight until morning, inasmuch as a heavy fog set in. We had been taking our turns also during these nights in keeping watch, and in the morning from twelve to five it was the turn of Captain Tyson,

myself, and the natives to sleep. At daylight we were called up by the watch, and were just preparing to jump out of the boat when some of them sung out, "Here is a steamer close by." Jumping out of the boat we saw a steamer about a quarter of a mile distant, but only for a few seconds, the fog being very thick; then Hans had the very good idea of taking to his kyak and starting for the steamer, so, if they had not seen us, to attract their attention; the flag was fastened to the other boat and shots fired, and very soon we had the satisfaction of seeing the steamer come alongside the piece. As soon as the steamer came in sight first, they cheered us and we cheered them. Two boats were sent from the steamer; all the men got into the boats and arrived safely aboard the steamer, which was named the Tigress, a sealing-steamer from Bay Roberts, Newfoundland. The captain, officers, and crew of the Tigress treated us very hospitably; all the men got clean clothing from the crew, and the men were lodged in the forecastle. Captain Tyson and myself had a room in the cabin. The Tigress had just come out on a second sealing-voyage, and did not intend to return right away, but was then cruising about to fall in with seals. A few days after we came on board the Tigress she got beset in the ice, and remained so for two or three days; we then saw a large batch of seals on the ice, killed about six hundred of them, got about half of them in, and the captain of the Tigress, Captain Bartlett, concluded then to force his way through the ice to Saint John's, to deliver his seals and also the rescued party of the Polaris. Running down the coast of Newfoundland we called into Bay Roberts, remained there a few days, and started for Saint John's, where we arrived on the 12th of May. In Saint John's the whole party was taken ashore by the American consul, and part of them lodged in the Atlantic Hotel and part of them in a boarding-house. We remained in Saint John's until the Frolic arrived. I had a star-chart on the ice, and that enabled me to take observations. The star-chart would enable me to take the declination and right ascension of the star. I had a chronometer; the chronometer was abandoned on the ice. I meant to work the observations over, but had no chance to get a nautical almanac. My papers on ship-board consisted of the meteorological record and astronomical observations; local observations while in winter-quarters; all the surveys; a private journal, that is, a record of transactions; meteorological journal of unusual phenomena; and some observations on the intensity of the earth's magnetism. These may be on board the Polaris. They were put on the ice, and floated off on a broken piece. We saw the Polaris stop once for a length of time, and it is possible that the papers may have been picked up by the Polaris. My papers were on the ice, and Mr. Bryan's also. I only accidentally went on the ice. I had a few books tied up in a bed-sheet, and heaving them overboard, it fell short, and so to pick them up I went out on the stern line, and then the ice parted and the ship went off.

Question. At the time when you were separated from the ship had you any idea that the separation was any other than purely accidental?

Answer. My idea was at the commencement that it was accidental, but I thought that they neglected to pick us up, for it was possible to do so. The ice was not sufficient to keep them from picking us up.

Question. Is it not possible, as they knew that you had the boats, and the natives were with you, that they might have expected you to come to them?

Answer. It is very likely they thought we could easier get to them than they to us, as we had the boats and the kyak, but the ship was

safer than the boat, which is always stove by a piece of ice. We had to keep clear of every piece of ice sharply cornered. They thought, perhaps, "They have got two boats; if they want to get to the ship they can do so;" so they showed indifference; otherwise they would have pushed through the ice and come and picked us up. I don't think that they had any intention to abandon us, but they looked to their own safety rather than to ours. I could not see much danger about coming through the ice at that time, and still later I saw a ship pushing through a great deal worse ice. The Polaris was not in very bad condition; she was a very strong vessel.

Question. Did not this give you an idea that the Polaris was in a worse condition than you thought she was?

Answer. I did not think she was in any worse condition than when we left her. I have only got to repeat the statement made yesterday: When we left the vessel all the connection-pipes were solidly frozen up—filled with ice; so, in order to get the engine to start, they had to take time. It must have taken at least from ten to twelve hours to get the engine to go. She could only receive additional injury while under the pressure, and if she received additional injury, then they would not have been able to keep her up until they had started the engine and pumped her out by steam, because they were short of hands—only fourteen persons aboard. If she was injured, we would not have seen her the next day steaming down.

Question. Yet when you did part from her did she not receive enough pressure to frighten everybody?

Answer. I thought so until I got on the ice. Then I learned from Captain Tyson that the small hand-pump was able to keep the ship free, and that was about the same as she had been before she came under this heavy pressure. The Polaris was a very strong-built vessel, and she would not have leaked at all unless she had received injury by listing on the iceberg. When she was tied to the ice the tide would raise her. During the course of the winter she would rise and fall about six feet. When we saw the Tigress push through this worse ice, we thought that as strong a ship as the Polaris might have pushed through the ice to get to us. This is the ground of my judgment. The wind was south and southeast when we separated. If the wind had not been from the southeast, she would not have been driven from the southward. The ship was driven north, and the ice we were on fetched up on the land. When I speak of the floe being jammed against the land, that don't mean that the floe itself just joins the land, but it was in connection with other pieces of ice which were jammed against another, and others against the land. We were about five miles from the land. The iceberg was to the north of us and the island to the east of it, and we were wedged in between the two. The wind was very heavy when we separated, snow and snow-storm. It was in the evening; it was dark; the sun was going down for a winter rest. In this snow-drift and snow-storm we could not see more than twenty yards. It was a dark time of year, and in the brightest day, when a heavy snow-drift set in, the view was very limited. The sun would rise about nine in the morning in October and set about three. The sun had been down about three hours. We tried twice to get to land, as I have described. The first time we were prevented by this small ice closing in between us and the land. When we started with the boats in the water we thought that the lead went right into the land, and before we got about a quarter or half a mile the pack-ice or small ice closed in, and prevented us from going any farther. This was on the small island called McGary, but

marked Hakluyt in chart. I have no reason to suppose that Captain Hall died any other than a natural death. About the disease, I can only say what was told me by the physician. The physician told me that it was a case of apoplexy. I knew he had been paralyzed, so I believed that he died of apoplexy. I cannot say whether this is a symptom of apoplexy. Long before he ever went on this sledge journey, while we were going up in the channel, he very often complained of severe headache and pains in the neck, which were so severe that he could not stand up, but had to lie down. I have no reason to suppose that Captain Hall died any other than a natural death. I don't know of anybody's threatening him. I have never heard of any. I heard Captain Buddington remark that Captain Hall's death was a great relief to him. I never heard anybody else make similar expressions. There was no suspicion on board the Polaris of any foul play. I don't know whether Captain Buddington was sober when he said this. I have heard him make this remark quite often, yet I did not take the remark as indicating any foul play on the part of Captain Buddington, but I thought he did not like to be under the command of Captain Hall, and had a chance to come out now that he was dead. I have seen Captain Buddington intoxicated a number of times, not before Captain Hall's death, but only afterward. The appearance of the country in latitude 80° north showed that it was visited with very severe weather; the rocks were cracked, and all the hills had a large amount of loose stones and sand in front of them, which had been cracked off by the frost and wind. The land, and especially the hills, were almost barren. In summer-time they would only produce a few flowers: field-flowers of different colors, and without scent, and small willow-shrubs, which would not rise in the air but only crawl along the ground. They were about half a foot long. The prevailing colors of the flowers were blue and red—bright colors. They are like the flowers I see in other places, but I don't know the species. I had a collection, but I have forgotten the species. The land was not covered with snow during the summer-time. In the spring all the ravines would be filled with water; it would be rushing down toward the sea in great streams. The elevations about our winter-quarters—Thank God Harbor—were up to 900 and 1,300 feet. I have taken the elevation of all the points on the east coast and on the west also. In the fall I was ordered to make a survey of Thank God Harbor. I made a survey by means of a plane-table, which I constructed. It was twelve miles long and nine miles wide. The survey of the channel and of Polaris Bay, and of the land as far as it could be seen to the south, I made in the spring of 1872. I took stations in Thank God Harbor and in Newman's Bay, and by these I made a survey of the whole district. Robeson Channel is about sixty-four miles long. The elevation from which I made the survey is 1,700 feet, and is in latitude 82° 9′. The horizon is forty-five miles distant. I saw to the north, as far as I could see, a bright line, which seemed to form a circle. This bright line has been seen by several others, and was taken for land by them. It was a very clear day when I saw it, and I took it for water. It was open water, I think. The only difficulty in getting farther north would be to push through Robeson Channel. Robeson Channel widens out, and very suddenly, and all the ice is gathered and pressed tightly together. The narrowest part of Robeson Channel is in latitude 82° 16′. If any vessel could push through this narrowest part, she could get as far as latitude 85° or 86°, and, perhaps, she could go farther. I was on the east side of Robeson Channel, and could see to the northward of Robeson Channel. The land to the east side runs round to the

eastward. I took the bearing of one point, which was to the southward of the point I was on. On the west side, on Grinnell Land, I took the points as far as it could be seen. Cape Union, on Dr. Hayes's map, is on a line with the coast-line. The coast here runs due north, and there were several points on the other side. Records were made of these surveys, and were among my papers. I just took the observations at the time. I thought I could see the horizon at forty-five miles. I could see no elevations. I just saw this bright line, which I took to be water. These observations were taken in latitude 82° 9′, and we had got to 82° 16′ in the ship. This was thirty-eight miles farther north. If there were any elevations directly to the north they could not be seen. The formation of the rock up there was slate. There were some petrified bamboo canes found in the slate. The soil in the lower part of the harbor was swampy. I could not give any judgment of the depth of soil, because we could not dig. The ground was frozen. The ground was frozen at the surface in September. In May we could dig down about nine inches before we got to the frost, and still later we could dig down from one to two feet. The lowest temperature that I observed during winter-quarters was 58° below zero, and this occurred in January, but the coldest month was March. During March the mercury remained below the freezing of mercury during the whole of the month. It did not get below 58°. The soil was sandy and very dry in summer-time; the moisture dried off rapidly. They had rain in Thank God Harbor while I was out on the ice. Whenever it is raining on shore it is snowing on the ice. We saw a great number of northern lights. I believe that any clear day in winter a northern light could be seen. There is none seen in summer-time. During night, I have thought, most every twenty-four hours a northern light will be seen. The northern lights were not in great brilliancy at the far north. The general feature was an arch, but at times we have seen streamers also, and where a corona was formed we saw a rosy tint. We saw a great many very brilliant lights, especially in the latitude of 60°. In the sixties (60°) the northern lights were very brilliant and very frequent, and in the seventies, far more rare; more scarce in this latitude than that we were in; more frequent, but less brilliant, as we got north. We had no auroral tables at our winter-quarters. We experienced great disturbances of the magnetic needle. The observations were made with the magnetometer. The disturbances were more previous to the aurora, about six hours. The needle varied twelve degrees. The original deviation may have been perhaps forty minutes. We saw a great number of shooting-stars in November and December. They were most abundant in November, about the 22d. In November I could hardly step outside of the observatory without seeing a shooting star. Did not see any meteoric stones. We found the musk-ox, white dogs, hares, and two kinds of lemmings. One has a red back and red cap; the other was gray; and both were white in winter. The one with a red back and cap is a little larger. We did not catch any fish. Saw immense quantities of shrimps, but no fish. I did not eat the shrimps, but one of the men had several dishes on board the Polaris. The shrimps were so abundant that in order to clear the meat from the bones of the skeletons, we just suspended them overboard half an hour, and the meat was all carried away. We took two skeletons of the musk-ox. I heard from the natives that the musk-ox that are there are not the same as those on the coast of Labrador. These latter have a strong smell of musk, and the meat has also a very strong taste of musk. We saw ducks and geese, snipes, (the geese are like our tame geese—no white geese,) dovekies, and partridges. We did not see any remains of

man, but we saw traces of Esquimaux in Thank God Harbor, on the ground to the southward. We saw circles of stones, which indicate that there have been Esquimaux tents. They use seal-skin for tents in the summer-time; when they pull up the tent they leave stones in a circle. We also found at Thank God Harbor the remains of Esquimaux weapons; for instance, the point of a lance, made of bone, and the smaller harpoon that they use with a line. These remains were very well preserved. They were not more than ten or twenty years old. If they are dug out of the ground and the bones are very old, they seem black; but these seemed to be very well preserved. There was another thing that makes me think that they could not be very old; they were taken out of a swampy soil, and this soil has been increasing so that we could see an increase during our stay at Thank God Harbor, and the depth at which these remains were found was not more than two feet. The increase was such that we could see and take notice of it. There is another thing that has been found at a great elevation: the runners of a sled were found at an elevation of 900 feet above the sea-level, on Cape Lupton. These habitations were summer-residences of the Esquimaux. It suggested itself to us that these Esquimaux had only come there during the summer, and had gone back to their real place of residence during the winter. It appears likely they had come from the west coast. I think so, because as far as the Esquimaux have been traced on the east side is below Humboldt Glacier, and we did not think it likely that they would start across Humboldt Glacier and come up to latitude 81° 38′, and more likely they came from the other side, from Grinnell Land. A very diligent Esquimaux could live up here by providing a supply of meat during the summer; there are walrus, and a multitude of seals. We generally wore woolen clothing, which is considerably warmer than skin clothing, which is made of seal-skin. It is only of comfort when the wind is very sharp, and if the woolen clothing is under the seal-skin it will prevent the cold entering through the woolen clothing. The deer-skin is the best, and bear is very warm, but we did not have it. Captain Hall did not succeed in getting it. Our arms were furnished by the Navy Department, and were Remington rifles and Sharp's. The metallic cartridges were very good. Joe says he likes the Remington rifles. He says he would very much like to have one. The breech broke off of the one he used during the whole voyage when we were on the Tigress. When I last saw the Polaris she was rounding Cape Robertson, coming down toward Northumberland Island. I didn't see her in harbor, but others have seen her—on the bay ice, as I have been told, between the islands and the west shore. The sound is about twenty-five miles wide. There are natives along here at Netlik, where is a summer-settlement of the Esquimaux. They leave their dogs during the winter on the island. The dogs do not try to get away. I think the Polaris will leave the harbor in the month of July, and she will have the chances of coming south and getting to Disco; there she can re-coal, and go down to Newfoundland. I think she is sound enough to go anywhere. If they should not be able to get her out of harbor, they can build a scow out of the timber of the ship, and go down in the same manner as Kane did. They have provisions probably to last them during the winter, and on their way home. All the pork is on board; a whole room filled with hard bread; a great nnmber of barrels of flour, rice, meal, &c. They will not be likely to kill seals, because there is no experienced hunter on board. It is very difficult for a white man to kill a seal. There were a hundred tons of coal left at Disco, and an immense quantity of stores. Disco is in lati-

tude 69° 13′. They are about 360 miles north of Disco. As soon as they reach the first settlement they are safe; this is about 250 miles from them. There is, however, an Esquimaux settlement within about 40 miles of them. Cape York is 100 or 120 miles from them; that is the next permanent settlement. I have no doubt about their being able to get out. They have a much easier time to get out than we had. It is very seldom that the ice-bar is below Whale and Murchison Sounds. The only difficulty they will have is to break out; and perhaps they will succeed in breaking out in July. If the ship should not be sound, they will have started by this time in a scow. They will have to build a sledge for the scow and sled the scow across the ice. They would have to build a scow 20 feet long. They are well supplied with provisions. There was some difficulty between myself and Captain Hall when we started, at Disco. The difficulty was occasioned by Captain Hall prohibiting me from making any meteorological observations, as he wanted me to attend to the navigation of the ship. I thought I had to comply with my orders. And Captain Hall intended to send me back to the States. He ordered me to attend *solely* to the navigation of the ship, and not make any meteorological observations at all. This is the only difficulty I had with Captain Hall. I do not know of any violence on board the ship—of any violence, or any symptoms of it. There was discipline as long as Captain Hall was alive; but I could not see much afterward. During Captain Hall's life the crew behaved pleasantly; there was no actual difficulty after Captain Hall's death. Our health was very good. There were a few symptoms of scurvy, but very slight; I had the scurvy, but not very much; but my legs were swollen and discolored; a few appeared to complain about their teeth and gums. Doctor Bessels's health was very good; Captain Buddington's health was very good; Mr. Bryan's health was very good. Dr. Bessels suffered very much from his eyes, and had very often to abandon his work on that account. There were a few attempts to make photographs, but they were generally failures. We had to use the observatory for a dark room, and the moisture would concentrate on the plates and freeze up, and so the chemicals would peel right off. The night we got separated Captain Buddington gave the orders to land the stores and provisions on the ice; I heard him. He said, "Heave overboard." The provisions were kept in order, so as to be ready at any moment. I threw my papers overboard, and Mr. Bryan threw his over on to the ice. It was understood that the order would not be given unless it would be necessary to go on to the ice. Captain Buddington was very much excited when he gave the order to "heave overboard." He ordered half the crew out on the ice; some men must go out on the ice and collect the provisions and stores. He did not send the Esquimaux out of the ship that I know. They labored under the impression that the ship was in a sinking condition. Then they put their children out on the ice, and put out some of their smaller articles. Captain Buddington was sober at this time. Captain Hall's papers were aboard at the time. When I saw Captain Hall's journal last it was in the hands of Captain Buddington. I never saw anybody tear anything out of the journal, nor burn any. I attended to the navigation of the ship after leaving Disco. I constructed the ship's track during the winter. It was very difficult, because we had no deviation of the compass. The ship was not swung to correct the compasses before we left harbor. These calculations were among the things that were thrown overboard. They were kept by me in a box. Mr. Bryan's were packed in a similar box; I did not see them after the ship went off. The Polaris steamed all the

way from Disco to Winter Harbor. She could not have got there without steaming. The wind was very light, and mostly from the north. At Newman's Bay and Polaris Bay in the summer-time we found drift-wood, not large timber, but small brush. That which was found in Newman's Bay was black walnut, ash, and red pine; some pieces were six inches long and some as much as twelve inches. It was in considerable quantity, and found only on the southern coast. I believed it came from the European seas. This wood did not grow at Newman's Bay, being much larger than the native growth of willow. It was not cut but broken. I looked carefully for wood on the northern shore of the bay, but could not find any. The shore runs from N.W. to S.E. Drift-wood was found the first summer on Polaris Bay. Wood appeared to be branches of trees; the pine was more decayed than any other; walnut was in a good state of preservation. When cut it seemed to give the smell of walnut; was evidently not the fragment of a vessel. A great number of records were put in monuments. When I went to Newman's Bay I deposited one record-cylinder, containing news of Captain Hall's death, with latitude and longitude of place of deposit. I believe I surveyed a little above 84° on the west coast; on the east coast about 82° 30′. The character of the coast, all along, is very sharp and well defined—Cape Lupton is the southern extremity of Robeson Channel; Cape Brevoort is the northern point of Newman's Bay. The name given to southern point of Newman's Bay, by Captain Hall, was Sumner Headland. The shores consisted of slate, and at the base of the cliffs were large quantities of broken slate and granite, the latter being broken from granite bowlders in the slate rock. It would seem that at some time the shores had been covered with glaciers, but at the present time none exist, except one at the head of Newman's Bay, which does not extend far to the southward; there are moraines visible on shores of Newman's Bay. One ice-floe in Newman's Bay was three days and nights and half of another day in passing a given point, at an estimated speed of nine miles per day. This floe must have been very wide, also, as it seemed to occupy the whole breadth of channel, grinding against ice on both sides. Pash-ice on coast of Labrador was fresh-water ice, ground up on the pack-ice along shore. The water we used on the floe during drift was obtained from small fresh-water lakes, formed from snow deposits. Salt-water frozen finally gives fresh ice.

In the spring of 1872, Dr. Bessels addressed a written communication to Captain Buddington, setting forth his wish that two sledge expeditions should be sent out under his direction—one to the south and the other to the north, and proposing a system of signals by which communication should be kept up with the ship in the event of her leaving winter quarters during the absence of either expedition. This was answered in writing by Captain Buddington, to the effect that he proposed to take the boats and go himself when the weather become favorable, and no further action was taken on the matter. I believe that a party might have gone much farther north by establishing a sub-base of supplies at Newman's Bay, and this would have been done but for the unpleasant relations existing between Captain Buddington and Dr. Bessels. I saw the whole correspondence referred to, and, in fact, wrote Captain Buddington's letter for him, under his direction.

Joseph Ebierbing (Esquimaux Joe) examined.

I have a home in this country, near New London, Connecticut. I came to this country with Captain Hall, first in 1862, and afterward in 1870, and went with him in the Polaris when she sailed from Brooklyn. Captain Hall was my friend.

Question. Can you tell us what happened on board the Polaris after you left Brooklyn?

[An evident difficulty in comprehending question.]

Answer. Ship all right while Captain Hall alive. We went, first, New London, then Saint John, then to Holsteinburg, Disco, Upernavik, Tessiusak, and to north. I don't remember how many days from Tessiusak to the north, till stopped by ice. There we remained till carried back by the ice; ice carried us back to place where we wintered. We were tied to the ice.

Question. What did you do in winter quarters?

Answer. I went to hunt musk-ox again with Mr. Chester, with Captain Hall's permission, having seen animals' tracks.

Question. Did you go on sledge journey with Captain Hall?

Answer. Yes; I drove one team of dogs; Hans, the other, with Mr. Chester.

Question. How far did you go?

Answer. I don't know, but by (straight) road fifty miles from ship, as Captain Hall told me. The road longer than this, but fifty miles straight. We staid two weeks. Captain Hall called the place Newman's Bay, and the northern part Cape Brevoort. Captain Hall wanted to go one hundred miles from ship, but darkness came on, and he could not. Then we returned to the ship.

Question. Did Captain Hall erect at Newman's Bay a *cache*, or leave any record of his visit?

Answer. At Cape Brevoort we buried the paper in different languages with writing which Captain Hall had for this purpose. We dug a hole in the earth, and made over it a heap of stone, or *cache*. We went on the ice a few miles farther north than Cape Brevoort, but were unable to land at a higher latitude on account of the weak ice along shore.

Question. Do you know of a *cache* erected at any other point?

Answer. Yes; whenever a party went from the ship to any distance to hunt, or for any purpose, a *cache* was built and paper deposited.

Question. How was Captain Hall's health during this journey?

Answer. Very good all the way and back; told me every time we stopped that he was happy; next spring would go farther north. When we reached the ship it was dark—before supper.

Question. How was Captain Hall's health at this time?

Answer. Very well, far as I know.

Question. Did you go on board ship with him?

Answer. Yes, sir.

Question. Where did he live on board ship?

Answer. In the cabin; with him, Dr. Bessels, Mr. Schumann, the engineer, and Mr. Bryan.

Question. Did you live in the cabin?

Answer. In the cabin below.

Question. When was Captain Hall taken sick?

Answer. After supper somebody tell me Captain Hall was very sick just after he came on board.

Question. Tell us all about it.

Answer. He did not come to supper. Then I went to see Hannah. I

had driven sledge very hard, and after supper went to sleep down stairs. Captain Hall did not eat supper, but only took cup of coffee. I did not see him that night. I saw him next morning, Sunday morning. He did not speak. He remained abed. After breakfast he asked to speak to me. He says, "Very sick last night." I asked him what is the matter. He says, "I do not know. I took cup of coffee. In a little while very sick and vomiting." He was sick the first time two or three days. Complained of stomach, headache, and bone-ache. After he got better I go to see him every day, every night. After a while something the matter with head. Did not know anything. Perhaps crazy. I tried to speak him. He did not know me. I wish to stay with him. Captain Hall called me to stay with him. After he got better, I asked him what made him sick. He says, "I don't know." Everybody went to breakfast. I staid with him. I said I was very glad he was better. He said, "I have been sick. Don't know whether I will live or not." I asked him, "Do you know what is matter?" He says, "I can't tell what is the matter. Bad stomach. Very bad stomach." After getting breakfast I wanted to find out what was the matter with him. A man came down into the cabin, and he said nothing to me more. After that Hannah talked to him. Every morning I was absent seal-hunting. I overheard Captain Buddington talk about Captain Hall. I wanted to hear. Captain Buddington said he was sick again. Did not know me. Once in a while he called, "Halloo, Joe!" Then did not know me. Two nights he was very sick. Died two nights and one day after.

Question. Did he speak to you again?

Answer. Last time did not know me. Wanted drink cold water. I tried to speak to him. He did not know me. I gave him a glass of water. He could not swallow it. It came from his nose.

Question. How long was he sick altogether?

Answer. I think about two weeks.

Question. Did he say anything else?

Answer. Nothing else.

Question. He did not say anything about being poisoned?

Answer. Yes; something. I can't tell sure. After getting to ship he asked me, "Now, Joe, did you drink bad coffee?" I told him no. I did not feel sick.

Question. Did you drink of the same coffee?

Answer. I do not know; the cook gave it to me.

Question. What more did Captain Hall say?

Answer. That the coffee made him sick.

Question. Was that when you first went to see him?

Answer. Yes.

Question. Did he talk to you afterward?

Answer. No; that was the last time he talked in that way.

Question. Were you with him when he died?

Answer. At that time very sick; did not know anything; could not swallow. Captain Buddington called me in the morning. He said, "Captain Hall very near dying; most dead." Then I got up and go see; his breath was gone. [Joe and Hannah much affected.] It was very hard at that time. Our friend gone. I did not see him much when he died.

Question. Did Captain Hall tell you at any time, when he knew what he was saying, that anybody had poisoned him?

Answer. Once, all alone, he tell me, "Bad stuff in coffee; feel it after awhile; burn stomach."

Question. When did he tell you that?

Answer. That time he was a little better.
Question. That was the only time he spoke of it?
Answer. Yes.
Question. Did you ever hear anybody else speak of it?
Answer. Some time after that I heard Captain Buddington and all the men in cabin talk; I did not know what they mean; I could not understand all they say; can't say what.
Question. You saw Captain Hall buried?
Answer. Yes; my wife and little child.
Question. Who read the service?
Answer. Mr. Bryan.
Question. Who dug his grave?
Answer. Captain Tyson, with some men; Mr. Morton; dug with pick-ax through the stone aud frozen ground.
Question. What did they put over his grave?
Answer. A board, with painted marks, at the head of the grave.
Question. What did they do after his death?
Answer. Nothing much; at that time very dark.
Question. Was there any quarreling on board ship before Captain Hall died?
Answer. Not much that I understood; I was out sealing every day.
Question. After Captain Hall died was there any quarreling?
Answer. Very little—sometimes.
Question. How did Captain Buddington treat you?
Answer. Pretty well; not so good as Captain Hall after that; he treated us pretty well.
Question. What happened till the time you were left on the ice?
Answer. We staid on board till Tyson and Chester went north in boat; I was not allowed to go with them. Captain Hall told me that we must go north before we turned back. Once in a while I asked Captain Buddington to let me do something before we return to America. I would like to go north before going south. Captain Buddington told me to go aboard; he would not let me go north with the party. Mr. Chester before, with Doctor Bessels and Mr. Bryan, went south some two weeks; I went with them. But Captain Buddington would not let me go north. I asked him to go on expedition proposed—one boat for Hans, another for me. He said, "You no go; you stay aboard ship." It made me feel bad. I never went north again.
Question. What did you do besides hunting?
Answer. Nearly all the men went in the expedition. I had work aboard ship to do.
Question. Do you remember when you lost the ship?
Answer. Yes, sir.
Question. How did you get out of the ship?
Answer. There was a big floe that the ship was alongside two months. Came south with it. After getting supper one night the ship came pretty near shore. Somebody called me and told me to get everything ready. I went on deck. In a little while ship was shaken by ice. Tipped up. Shoved up on beam-ends. Everybody worked to get provision and clothing on ice. Captain Buddington sent us down on the ice. Then Hannah and little girl got on ice. Blowing hard. Very dark. Half the men on board ship. Men working on the ice. I was helping. I had rifle and ammunition. Took care of my rifle for fear I should need. After while wind came harder. Storming. Ice broke between us and the ship. Ship floated off. In a little while we lost her. The anchor holding ice had broke away. We waited till daylight. I

thought we should never again see steamer. After daylight I saw, the other side of cape, smoke. I thought the vessel would come to look for us. We could see steam-pipe on board ship. We put big rubber blanket on mast, but they went back of island and did not come for us. Can't tell whether they were much injured or all right. Ship no leak. No hurt about it. I went to look after my things, and in a little while ship gone.

Question. You don't think they left you on the ice on purpose.

Answer. No, ice broke. Captain thought he would lose ship.

Question. Do you think the ship could return to you?

Answer. Everybody think she could come back. Ice in small pieces. Had gone through much worse ice before.

Question. Have you with you anything belonging to Captain Hall?

Answer. Yes. I have Captain Hall's writing-desk.

[Witness produces writing-desk, containing several packages of letters addressed to Captain Hall, and other papers.]

Question. Where did you get this?

Answer. From Captain Buddington. He told me, at first, that it belonged with the ship's papers, but at last he gave it to me. It was put out on the ice with the other things from ship, where I found it. I lived on the ice with Captain Tyson. Men were sometimes hungry and unruly.

Question. Was everybody on board ship well when you saw them last?

Answer. Yes. Dr. Bessels, Mr. Bryan, and everybody. Plenty of seal-meat. Plenty of provisions.

Question. Do you think the ship safe?

Answer. I don't know. If they try to save it they will save it. It is very strong. Can be saved.

Question. Do you want to return North?

Answer. I would not like to; Captain Hall my friend. With a man like him, I would go back. Captain Buddington get drunk sometimes, little after Captain Hall's death; didn't see it before. Once in a while Captain Hall would distribute little liquor to crew.

Question. Is there anything else you can think of, or that you want to tell?

Answer. Captain Hall good man. Very sorry when he die. No get north after that. Don't know nothing more.

Hannah (wife of Joe) examined, Joe remaining present.

Question. You are the wife of Joe?

Answer. Yes.

Question. And sailed in the Polaris with Captain Hall?

Answer. Yes.

Question. Did anything remarkable happen before you got to Disco?

Answer. Nothing. We went north, stopping at Upernavik and Tessiusak, and thence till stopped by the ice. After we were stopped by the ice the ship was driven back, and then went into winter quarters. I remember Captain Hall's departure on the northern journey, and his return. I came down on the ice to see him. He was pleased with his journey. Had had a good time. He said he would finish next spring.

Question. When did you next see Captain Hall on board ship?

Answer. About an hour after getting on board Captain Hall sent the

little girl to call me up. I found Mr. Morton undressing him, and washing his feet. Captain Hall was sick. He spoke about being sick and vomiting. He said he had vomited three times since he came on board. I asked him if he had got cold. He said he felt well enough in the morning.

Question. Was he numb on one side?

Answer. He did not say.

Question. What did he say else?

Answer. Nothing else at that time. He wanted me to make ready things for journey with Tyson and Chester. He thought he was going to get better right off, and wanted me to be ready next day but one.

Question. Did he say anything about the coffee?

Answer. Not at that time.

Question. When did he say anything about it to you?

Answer. Next day. Very sick then. Worse than last night. I observed him close. He was very sleepy. He felt bad. He wanted to keep still. Did not say much.

Question. Did he say anything to you about coffee being bad?

Answer. After he had been bad about the head he began to get better. Then he talked about the coffee. He said the coffee made him sick. Too sweet for him. "It made me sick and to vomit."

Question. He said it was too sweet for him?

Answer. Yes. That was all. I used to make coffee for him and tea. He said he never saw anything like the coffee he took on coming on board.

Question. Did he say anything to you about anybody having poisoned him?

Question. When something was the matter with his head, and he was hallooing and talking, he spoke of somebody having poisoned him; but only when he was crazy.

Question. Did you believe anybody had poisoned him?

Answer. No; I did not believe it.

Question. Did Captain Hall have any quarrel?

Answer. No quarrel that I know of.

Question. You were with him every day while sick?

Answer. Yes, sir.

Question. You never heard him accuse anybody of having poisoned him, except when delirious?

Answer. No.

Question. Did Captain Hall speak to you after his first sickness regarding his feelings?

Answer. Captain Hall told me after his first sickness that his stomach was all right, and thought he would get better.

Question. Did he tell you anything about his papers?

Answer. O, yes. He said to take care of the papers; get them home, and give them to the Secretary. If anything had happened to the Secretary, to give them to some one else. After his death I told Captain Buddington of this charge several times. He said he would give them to me by and by.

Question. Were you with him when he died?

Answer. Yes, sir.

Question. How was he when he died?

Answer. Very bad. Would halloo. He wanted Captain Buddington to come up stairs. Joe got up. All the rest got up. Did not know us then. He thought he was dreaming. I asked him what he was about. He did not know what he was saying. He looked at me, and wanted to

know where Hannah was. Did not know me. Then, till ship came south, Joe was hunting, and I remained on board.

Question. Do you remember when you lost the ship?

Answer. Yes, sir.

Question. How was that?

Answer. The wind blew hard. We were driven on ice. Captain Buddington thought the ship was going to be lost. Ordered everything ready to go on ice. I took my clothes. We tried to get everything off. We all worked like horses. Everybody tumbled over everybody. Then I went on the ice, and then came aboard again. I had left my trunk on board. I asked the fireman who was pumping how the ship was. He said the ship was all right. Was not tipped over at this time. He was pumping close to my door. He said, "You need not carry anything more out, you will come aboard all right to-night." I staid down in cabin a few minutes. Captain Buddington told me to go on ice, and to take my things with me. I told him that fireman said, ship all right. He replied, "Never you mind; take little girl and go on ice." Mr. Myers came on ice little after I did. In a few minutes ship went. Very dark. Snowing thick, wet. The ship broke away from us. The hawser slipped from anchor, which had been planted in the ice. It was gone in a few minutes, it was so dark.

Question. Did you see the ship again?

Answer. Yes, next morning. We tried to go on shore, to the ship, but we were prevented by the drifting ice. Then we got back on the same floe. That night we were blown away and floated off. We never saw the ship again. I think the ship would have saved us if she had come out after us in the first place, but the heavy wind carried us off. We felt bad enough.

Question. Don't you think they tried to come to you?

Answer. Don't believe they saw us; we saw them.

Question. Do you think the ship is all right now?

Answer. O, yes; it is safe. It is in a very good place. There are no icebergs there. They are behind a little island. They will be able to get out in the summer-time.

Question. Do you think they have plenty of provisions?

Answer. O, yes; some Esquimaux there. They can hunt for fresh meat. Esquimaux can come to them as soon as the ice is made. We floated off on this cake of ice. We were on it nearly five months. Then we traveled from piece to piece.

Question. Who was in command of the party on the ice?

Answer. Nobody.

Question. Was not Captain Tyson in command?

Answer. Well, he did not have much. He could not control them. He tried to do everything he could. He was a good man. We have known him a good many years. He tried to do everything for the best; sometimes they would not mind him; I sorry, and Joe very sorry too. Some time little provisions left; just before we were taken off, about a week, we thought we were going to starve, but the bear saved us; the bear came across the pack-ice. He smelt the seals, and the people. Joe chased him; the men laid down out of sight. These animals sometimes go out on the ice in that way. Have seen Esquimaux crazy sometimes. No doctor; some of us take care of him; sometimes men, and sometimes women; don't know what makes it.

Hans Christian examined.

Question. Do you talk English?

Answer. Very little.

[The examination conducted principally through interpretation of Joe and Hannah.]

Was in the ship when Captain Hall died; was with him in his journey north; with Mr. Chester and Captain Hall.

Question. Was Captain Hall well?

Answer. Yes, very good. Came aboard in afternoon; pretty quick he got sick; don't know what was the matter.

Question. Were you with him while he was sick?

Answer. I was alongside of him after he was sick.

Question. Was he crazy?

Answer. I don't know. (After urging by Joe.) Yes, all the time. I remember the night when we lost the ship.

Question. How did you get out of her?

Answer. I took wife and children out, and put them on the ice. I thought ship was gone. Ice soon broke. Line break, and ship went away in the night. Little use on the ice. We floated on the ice for six months. Killed two bears and many seals, and at last were picked up by Tigress.

Hannah was directed to ask Hans if he had anything more to say. [Hannah.] He has nothing further he wants to say. Too hot here; children sick, and he wants to go home right off.

[Hans much pleased at promise of return to Greenland.]

John Herron, steward, examined.

I was born in Liverpool, but am a citizen of the United States; 31 years of age, and was a steward of the Polaris, and sailed with her from New York. After leaving Upernavik, we were progressing northward. Were stopped by the ice a little, but forced our way through it across Melville Bay, and up Smith's Sound. Went on till we came to what was supposed to be Kane's Open Polar Sea. We found that to be a bay. Captain Hall called that bay Polaris Bay. Went beyond that through another bay, about thirty or thirty-five miles wide, which Captain Hall called Robeson Channel or Strait. We went up this channel to latitude 82° 16′; that was what the scientific men made it. Don't think Captain Hall thought it was higher, at least didn't hear him say anything to the contrary. I could not see through the strait at that time, as it was hazy, but the following summer I could. We came down into Polaris Bay, where we had our winter-quarters. We put provisions ashore, and built an observatory on shore for the scientific men. On the 12th of October Captain Hall went north on a sledge-journey. A very stormy winter-day set in, and I was afraid he would suffer from the cold. When he came back I asked him if he had been in snow-houses, but said he had been traveling all the time. He came back on the 24th of October. I met him in the gangway, and shook hands with him. He seemed pleased with the way things had been going while he was away. Presume he had a good account from Captain Buddington. He thanked the men for conducting themselves so well while away. When he came into the cabin the heat seemed to affect him very much. The

temperature in the cabin was about 60° to 70°; outside it was about 15° to 20° below zero. I think the change of temperature affected him. All our men have suffered, and I myself have suffered very much since we came aboard the ship Tigress. He asked me if I had any coffee ready. I told him there was always enough under way down stairs in the galley. I asked him if he would have anything else. He said that was all he wanted. I went down stairs and got a cup of coffee. I did not make the coffee. I told the cook it was for Captain Hall. He drank white lump-sugar in his coffee. Never cared for milk. He then took a hot-bath, a foot-bath, with a sponge. He did not complain of feeling unwell when he drank the cup of coffee; said he felt tired, and soon after laid down for the night. I don't think he was sick that night. He might possibly have been sick without my knowing it. Not until a couple of days afterward he had the doctor attend to him. He was not a man to take much medicine. Dr. Bessels attended him. I think it was on the third day when he took to his bed. He was taken down suddenly. I thought it was the heat, and the doctor said it was apoplexy. He might have been paralyzed before he died. I do not remember about that. There were a few times when I thought he seemed to be getting well. I saw him sitting in the cabin dressed and writing. I asked Mr. Morton how he was. We did not eat in that cabin then. We had another place for dining, and I didn't go in very often through the day. I did not see him die, but shortly after. It was in the morning, a little of three o'clock. I have forgotten the day; some time in the early part of November.

Question. Did you hear that he accused any one of trying to poison him?

Answer. I have heard him pass remarks of that kind about his medicine, but did not take any notice of it. One night he threw his curtains aside and said the cook had a gun in his bed, and wanted to shoot him.

Question. Did you have any idea that he died from any other than natural causes?

Answer. No, sir; and have no other idea than that now.

Question. Was there any quarreling between him and anybody else?

Answer. There was something that was not right between him and Mr. Meyer at Disco. Something about an order he would not obey. Captain Hall wished him to do some writing for him, which he refused to do. Captain Hall told him he was the officer of the vessel, and Mr. Meyer said he had his orders from headquarters. Captain Hall wished him to produce these orders, and then Dr. Bessels took the thing up and said that if Mr. Meyer wanted to go on shore he could do so. The men said if he did they would do the same. Captain Hall then went himself and spoke to the men. The consequence was Mr. Meyer went to his duty, and Dr. Bessels to his. During Captain Hall's life-time there was nothing more of this kind. I think every man respected Captain Hall very much; I do not believe there is any one that would have done anything wrong to him. There was a coolness between him and Dr. Bessels; I don't believe he was the man he expected when he left the United States, and he could not help showing it sometimes. That is the only reason I can see for it. Captain Hall died and was buried, and the ship lay in winter-quarters until the next summer. We drifted up alongside an iceberg, where a spur made out under her bow. We could not get her off, and she rode on that all winter, rising and falling with the tide, straining her stem so that she leaked very bad next spring

when she broke out. That was the only leak she had. I never knew her to make much water on the passage. During the winter we done very little; when the weather permitted the men cleaned decks but most of the time they had nothing to do but amuse themselves. The scientific men kept up their observations night and day, relieving each other—I mean Dr. Bessels, Mr. Bryan, and Mr. Meyer. In the spring they went on an expedition north. Captain Tyson went in one boat, Mr. Chester in the other. I did not go with them; I was with the ship. I didn't take notice what the temperature was there in the summer, but in quiet weather, when there was not wind, it was very nice weather. There was not very much snow; the snow that falls there is as fine as flour, so fine that if we were not dressed in skins it would go right through our clothes. There were plenty of flowers there; they grow out of a kind of moss that grows there; there were several specimens brought aboard the ship. If the ship comes home there will be plenty; I have none here with me; could not save any. I remember seeing some timber that had been carried there—part of a sleigh. There were traces of Esquimaux in Polaris Bay; they seemed to come down in the fall and go up again in the spring. There was also a little drift timber brought back to the ship; it was so much worn could not say what kind it was. They had also made a fire in Newman's Bay. There were some records put ashore in Polaris Bay, in a mountain; I have forgotten the name. I heard them speak about it; I did not see them do it; but of course it was done. Captain Hall threw some of those cylinders overboard with records in. We finally started to go south in August. We had tried to go farther north. We went on the mountain and could see pretty good water to the north. Just at that time we thought we would have little difficulty in getting north. Finally concluded to go south; tried to pick the best route. We had about 40 or 50 miles pretty straight run, and then got beset; drifted right down and got surrounded. We tried several times to get out; we tried to get into one of the leads, but found it impossible; if we had more steam-power we could have done so. The screw of the steamer was bent; the ice had been knocking against it.

I remember the night we got separated from the ship; it was the 15th of October; it was almost altogether dark in that latitude then; it happened in the evening; wind was blowing; cannot say if it was snowing; it is always drifting there. I did not keep any record aboard the ship; I did not have time. On the ice I did. The ice came pressing in on our starboard side. Captain Buddington gave the word for every man to save what he could, and look out for his life. We had everything brought on deck for such an occasion; everything was in readiness. The first thing we done was to place the women and children on the ice, expecting the ship to go down every minute. Next thing we threw over provisions; we threw them so fast that some of them were getting lost. Captain Buddington sang out for some of the men to get on the ice. We got on the ice to move the things back, and then went aboard to get some cooking-utensils. I went aboard to hand some things out; I had been out again but a few minutes when they sang out, "Lower the boats." The ice we were on was cracking. The ship slipped anchor, and in three or four minutes we were afloat on different pieces of ice. The ship went away in the darkness. We had an immense quantity of provisions, but saved very little of them. We tried to get ashore next morning. We thought by launching a boat we could take everything we had ashore. We got about half a mile when the running ice stopped us. We saw the ship to the northward of us; we

all thought she was coming for us. We set a flag up; we had an India-rubber blanket, and thought they would see it against the snow. I think they could hardly help seeing us. We remained there quietly, thinking they were coming for us. She steamed behind an island, Northumberland Island I think it is called, and then we lost sight of her. We saw she was not coming for us. At the same time we went drifting south. We tried again that night, but could not get ashore; tried several times after that, but lost things each time. We finally got back on the main floe, on which the ship was originally anchored. In trying to get ashore we lost one of our boats, but found it again afterward.

Question. What do you think of the condition of the ship?

Answer. When the order was given to get the things off, and the fireman went back, the mate told him to stay on board; she was making no more water then than she had been all along. I do not think the crushing she received then made her leak any more; she was a splendid ice-boat if she only had a little more steam-power. She was built very strong. Her beams and knees were sound and good. I don't think Captain Buddington meant to abandon us. He either thought we could easily get ashore, or else he could not get through the ice. I don't think he would do anything of the kind. Standing on the ship, you would naturally think we could get ashore; it may have looked to him that we were right under the lee of the shore. It is very likely that he thought we could get ashore, and that he didn't understand our signals.

Question. Do you know if Captain Buddington ever got drunk?

Answer. You want the truth; I must answer you when you ask me. He did, both before and after Captain Hall's death; oftener after than before. Captain Hall must have seen it on him several times. Captain Buddington came to me and wanted me to give him some liquor; he said he put a case in the store-room that was not on my list; so I went to Captain Hall and asked if he would be kind enough to put the liquor in the magazine. You ask Captain Hall anything, he would look at it in the right light. He did that, but that didn't save it; he took it away and I didn't have any more to do with it.

Question. Did you ever see any of the other officers, except Captain Buddington, drunk?

Answer. No, sir; they used to drink, but I never saw them drunk. Captain Buddington, if he drinks at all, must get drunk. He drank whiskey while it lasted. I have seen him drink alcohol before we came away. There were several cases alcohol on board the ship. When I didn't know where he got his drink from, I thought he must have been at the alcohol. I couldn't dispute anything with the captain of the ship.

Question. Do you know of any difficulty happening to the ship on account of his being drunk?

Answer. When we got beset in the ice in 80° 11′, I think he was drunk on these nights, but it was not the drink's fault that we got beset. He was not drunk when we parted from the ship; I am pretty sure of that. I do not know of any dispute aboard the ship at any time. After Captain Hall died, Captain Buddington took command, and his command was submitted to by everybody on board. I kept a record on the ice after we left the ship, every day, from the time we parted from the ship till we were picked up. That will tell the story better than I can tell it now.

Question. Do you think the Polaris will come out all right?

Answer. Yes, sir; she is in very good winter-quarters; by next month will be making water. They have plenty provisions aboard. They have fewer people than we. There are fourteen men on board; we have sixteen. They have got rice; plenty of flour, enough to have fresh bread every day. They have about twenty-five tons of coal on board. Would not have enough to steam to Disco. Could steam over, no doubt, with the wind in their favor. Captain Tyson had command on the ice, but he never seemed to take much of a lead. Everything seemed to go along very well. Captain Tyson stopped with Joe and Hannah, and I saw him very seldom. Hans and his family had a snow-hut built for themselves. There was not a great deal of commanding on the ice. It was not wanted. When we didn't do what he directed, it turned out wrong. (Exhibiting records.) These are the original records kept by me on the ice, three small books in lead-pencil, and these are copies which I have had made for convenience. The records were made from day to day on the ice, whenever I had an opportunity. I made them every day. They give a detailed account of what happened to us until we were rescued. When I was separated from the Polaris everybody was well. Dr. Bessels was well. He had been in good health from the beginning. I never heard him complain, except from snow-blindness. Mr. Bryan had been in good health all the time. Very much respected on board the ship. Everybody liked him.

Question. Do you think, barring accidents, there is any doubt of the ship's coming out all right?

Answer. I think she will. I said all along that I expected we might see her in New York or Washington when we got back.

John W. C. Kruger, seaman, examined.

Witness stated that on shipboard he was often addressed as Robert.

I was born in Germany. I have lived in this country, but am not naturalized. Am twenty-nine years of age. I sailed in the Polaris from Washington. I remarked nothing of importance between New York and Disco. At Disco there was some grumbling in regard to the "grub." Rumors were afloat in the ship that Dr. Bessels, Mr. Meyer, Mr. Chester, and the engineers, and Captain Buddington were about to leave the ship. There was some talk among the crew, but it amounted to nothing. We didn't know at the time that it had attracted the attention of Captain Hall. I did not hear anything of it from Captain Buddington himself. It amounted to nothing after we left Disco. We were very well content. From Disco we went to Upernavik, and from there to Tessiusak, and thence we proceeded north, and in a couple of days sighted Cape York. We passed that evening Cape Athol. We saw a good many walruses. We set our course north along the Greenland coast as far, I believe, as Dr. Hayes's winter-quarters, Port Foulke. We crossed the strait about this time to the west coast. We landed with our boat at Cape Frazer, but found it was too shallow water, and so proceeded on our way north. We passed Cape Constitution, Dr. Kane's highest point. We steamed on north for a couple of days, and reached what was known as Kane's Open Sea. We found a good deal of water, but on both sides land, forming a large bay. We went from there to latitude 82° 16′. We could see land on both sides of us farther north. We were beset there with ice, and took some of our provisions on the ice, in case we should have to leave the ship. I believe we were delayed

two or three days on this floe. When the ice separated again we steamed south toward the east coast. We made our latitude 81° 38′, and Captain Hall named the position Thank God Harbor, in Polaris Bay. The harbor was formed by an iceberg. It was a very poor harbor. We took provision out of the ship to the shore, and tried to secure our ship as well as possible. The ice soon set around us, and we prepared to bank our ship. At that time Captain Hall started on a sledge journey. He was away fourteen days, and returned well and healthy. He was accompanied by Mr. Chester, Hans, Joe, Captain Tyson, with two sledges. He seemed in good health on his return, but after he had been about an hour aboard he was reported sick, with rumors of apoplexy. I think I did not see him while sick, but only after his death, in his coffin. We were very sorry when he died, because Captain Hall had been very kind to us, and with him all order and command in the ship died, too. Captain Buddington took command. During the winter I was engaged with the tide observations, and don't know much of affairs in the ship. I was with Hermann Simmons, another member of the crew, now on board the Polaris. I made these tidal observations first at Dr. Bessels's orders; afterwards at Captain Buddington's. I performed this duty until the 1st of May. I made the observations about fifty yards from the ship. An accurate record was kept. The highest tide that I noticed was 7 feet 8 inches at spring-tide. The lowest neap tide was about 2 feet. In May I was taken from this duty, and was put to work at the boats, marking the lead lines. Nothing further occurred on board ship until we set out with the boats north. I was in Mr. Chester's boat. Two boats went north; Mr. Chester in command of one, and Captain Tyson of the other. After we had been about three days absent from the ship, we were unfortunate enough to lose our boat. We saved nothing but our lives, and our boat was completely smashed to pieces. The accident happened about 9 miles from the ship, and we soon got back to the ship again. Then Mr. Chester inquired of the boat's crew, whether we would be willing to go with the patent canvas boat. We went with our canvas boat as far north as possible. I believe it was latitude 81° 51′ 26″, in the mouth of Newman's Bay, where we had to lie on the ice. We could not reach the shore. We could recognize Cape Union about 35 miles distant, on the west coast. On the other side we found a cape which Captain Hall named Cape Brevoort. He was as far as that on his sledge journey, I heard afterward. The ice that we saw was very much built up, and we did not see any chance of getting through with our boats. The straits were completely blocked by the ice. I don't exactly know how long we laid in Newman's Bay. Mr. Chester expressed the wish that we should have more provisions. We had very little—only about a month's provisions. Hermann Simmons and I started for the ship to get more provisions. It was about 22 miles to the ship. We found her in open water, and in a very leaky condition. Captain Buddington wanted to keep us aboard, and didn't want us to return. After we had been about two hours aboard, the Polaris steamed north to try and reach the boats, but could not get so far. We laid right over in the straits drifting. Next morning we landed Hans, with a letter for Mr. Chester to come aboard immediately with his boats. Hans went up, and they returned with Dr. Bessels. The rest of the party remained in Newman's Bay. We tried to make our way during the night north again. Ice stopped us, and we had to return south. Dr. Bessels said to Captain Buddington that he was not able to work his boat without his men. So we left next day with provisions, and the letter for Mr. Chester. This letter was given afterward, by Mr. Chester, to Cap-

tain Tyson. When he had sent the letter, and ascertained that the latter was in a very poor condition, he returned to the ship from the land. He left the boat in Newman's Bay, and returned to the shore from the land, with his crew. We laid over some days, lingering, to see if we could get a chance to get north; but it was of no use; the ice was very bad; and then Mr. Chester made up his mind to return. We rolled our boat on the same place where the other boat was lying, and returned to the ship. The ship was pumped until that time by steam; but after we got on board we set our deck-pumps to work and pumped her by hand. She made considerable water, and after having been aground, made much more. The ship was hurt in the following manner: In the latter part of November it set in a heavy gale; we were near the iceberg, in Polaris Bay. We dropped our second anchor, but, notwithstanding, got listed on Providence Iceberg, as Captain Hall called it. Later we got our ship farther on the berg, and the ice being very strong, we could do little with it. After it seemed that the foot of the iceberg was far under the ship; she raised up high out of the water with it, and at last it broke her. We tried all we could to stop the leak, but could not do much with it. On the 12th of August, 1872, we set out for the south with our ship, but didn't get very far, and we had to make fast to the ice in latitude 80° 2′. We fastened to the floe because there was no water to the southward. We worked south as well as we could. We were beset in latitude 80° 2′. This was the first observation made by Mr. Bryan. We then anchored fast to the ice-floe. We could not get out, for the ice was too close, until the 15th of October, but drifted along on this floe. We had built a house on the ice in case of accident; and also put out eleven and a half boxes of bread. Our provisions were already on deck, so that we might cast them on the ice. The 15th of October it blew a very heavy gale from the S.E., and our ship was very heavily pressed by ice. Captain Buddington found it necessary to transfer the provisions to the ice. Half the crew remained on board to put them over the side; the other half were on the ice. When most of the provisions from the deck had been thrown on the ice, the pressure on the vessel ceased and she righted. Shortly afterward the ice cracked, and the floe on which we were broke in several pieces. On the small pieces were left most of our provisions. Soon afterward the ship drifted away from us to the north. The ice-anchor remained in the floe. We could not tell whether the hawser had broken or slipped. After the ship had got away we tried to save the provisions. We could, however, save but little. We expected next day that we should get on board of the ship again. Next morning we could not see the ship. Captain Tyson proposed to go with the boats and provisions toward the ship. Soon afterward we put our boats to water, and tried to pull them toward the shore, but did not get far. We then saw a vessel steaming toward us, and didn't give ourselves further trouble, because we supposed the vessel coming to take us off. We hoisted a blanket on an oar, and supposed we had attracted attention. The vessel was about four miles distant. We saw her steaming in toward a bay on Northumberland Island. She was under steam and canvas. She seemed to be all right. There was about fifteen tons of coal on her when we left. I thought, if Captain Buddington had seen us, he probably would have come and taken us off. At the same time a heavy gale sprung up from the north, and the ice started with us and drifted south. We tried once more to reach the shore with our boats. I should judge the ship about two and a half hours in sight. Then she steamed behind the island. We afterward got sight of her between the island and the main land.

I cannot tell whether she was then at anchor, but supposed her so, as her sails were down. We tried once more to reach the shore, but were turned by the drifted ice back on the floe. The next day we were separated from one of our boats, when the floe broke in several pieces. On the first of November, or latter part of October, we tried once more to reach shore with both our boats. We transported them about four miles, and damaged them pretty badly with ice, and next morning found that we could not transfer our stock in one day, and we had to remain on that floe with our boats during the night. Next morning the ice was broken up, and we could not get the stuff that was left behind us. We then drifted south, and several times sighted land, until the 30th of April, when we were picked up by the Tigress. I kept a record on the shore and on the ice. I lost the record that I kept on board the ship. I have here a record, kept on the ice; it is written in German. It records what happened on the ice from day to day. I have also a book of records kept by Hermann Simmons, which I picked up on the ice among his clothes, which had been thrown overboard. It is a record of the voyage of the Polaris, from the time we left New York until the 12th of October, three days before we separated. I know this to be his book from his name in it, and because I saw him writing it on board the Polaris. I think its statements are correct. We were intimate friends, and used to write our books together. Here is another book which was picked up on the ice by William Jackson, the cook, and given to me. It seems to be a memorandum-book by Mr. Morton. While we were in winter quarters, in Polaris Bay, we did not do a great deal of hunting and fishing, but in the spring there was a great deal of hunting done, there being twenty-nine of us. The scientific men made observations. Mr. Bryan took astronomical observations. In the spring, Dr. Bessels, Mr. Prin, Hans, and Joe, made sled expeditions to the south. On the sled expedition to Newman's Bay, we found considerable driftwood on the southern shore. Altogether, there were picked up twenty-four pieces. The correct statement will be given in Simmons's book. It was principally pieces of two feet long and round, the limbs of trees, and a good deal larger than any vegetation in that latitude. I don't know the kind of wood. There was a good deal of slate rock; I did not know the other kinds. There was not a great deal of snow on the land in the summer time, except in the ravines. The sun was hot. When I made a trip from the ship back to the boats with provisions, I slept on the top of a mountain. The sun was shining brightly at midnight, and it was very warm. On Cape Lupton we found pieces of a sledge; at Polaris Bay we found signs of Esquimaux huts, and also a broken spear. The scientific men gathered a good many specimens of all kinds of animal life there. The birds that were shot, Dr. Lefford took charge of and stuffed. I never heard of anything wrong concerning Captain Hall's death. I never knew of Captain Hall having any difficulty with anybody on board. I didn't see him when he was sick. I heard reports from Captain Hall's clerk that, while he was sick, he was afraid Captain Buddington would shoot him; but that was while he was delirious. I never saw any of the officers of the ship drunk, though it was reported it was often the case. I heard that Captain Buddington was drunk, from Joe, the Esquimaux. This he said, before all hands, on the night that we were crushed by the iceberg in Polaris Bay; but I never saw any of it myself. When we were floating down I did not believe there was any liquor on board after that, unless it was alcohol. There was very good discipline as long as Captain Hall was alive, and

he was very kind to us and was liked by his crew. Not only did the expedition lose a commander in him, but we were heavy losers in all regards. After that there was not much discipline; very few orders were given; every man seemed to look out for himself. I believe if Captain Hall had lived we would have got very far north, for every man of the crew would have been willing to have gone with him wherever he went. After he died there never was much effort to get north; the main object seemed to be to get out. After we had reached the highest point, and when we first stopped, latitude 82° 16′, and were driven back by the gale; after the gale there was considerable open water to the north. If we had pushed on then, though we could not, perhaps, have made a due north course, we could have got through the ice, as we did afterward in coming south. I don't know, myself, why we didn't push on north. I didn't know, myself, of any difficulty between any of the scientific men and Captain Hall; that is, not after we left Disco. I cannot say whether Captain Hall had any difficulty with Captain Buddington at Disco. I believe that the ship will not be able to get down without assistance, because she had very little coal. She was left, however, not far from Etah, an Esquimaux summer settlement. The ship is in latitude 77° 35′. She has sails, but could not get through the ice with them. When we separated from the ship all on board were well. While floating down we were on one floe for five months. This large floe was very steady, even in a gale. When the floe was broken up into smaller pieces, the sea would toss the ice about. When the ice was in large pieces, it was a good deal jammed together, and the sea had no chance to make. I believe we were better off on the ice than if we were on the land, because we floated steadily south, got earlier light and earlier spring, besides getting nearer home. We also had a chance to catch seals, upon which we lived. We were very short of food until we began to catch seals. They have plenty of provisions on board the ship; their great difficulty will be the absence of boats and want of coal. Another difficulty is that the natives are not with them to hunt for fresh meat. They may, however, communicate with the natives on the main land. Captain Hall used often to ask us if we would live on raw meat, as he himself did during his lifetime. We told him we could live on what he did. We did not try it, however, while he lived, but when we got on the ice we soon found we could live very well on raw meat. Raw meat gives the body more animal heat. I have seen Captain Hall eat raw meat from choice.

Frederick Jamka examined.

Born in Prussia; twenty-three years of age; seaman. I joined the Polaris at New York. I know of nothing of importance till the vessel reached Disco. There was at Disco a little trouble among the officers; I don't know exactly what it was about. I mean by the officers the men who lived aft. The trouble was, I believe, between Mr. Meyer and Captain Hall. I understood that Captain Hall asked Mr. Meyer to keep a book for him, and Mr. Meyer refused. Captain Buddington was always quarreling, declaring his intention to leave at every port; coming forward and talking among the men at every port; but I never saw him make any attempt to leave. The row was settled at Disco by Captain Hall before the Congress left. From Disco we went to Upernavik, and from there to Tessiusak, and from there toward the north. We

went up on the Greenland side to Port Foulke, where we crossed to the opposite side. Then we followed up the west shore to a cape, of which I don't know the name. We stopped, and Captain Hall went on shore. Captain Tyson came on deck, and asked Captain Buddington what Captain Hall had gone on shore for. Captain Buddington asked Tyson if he expected to go any farther north than that. Then Captain Hall came on board, and we started on our journey north. We went to about latitude 82°, but could find no winter quarters, and then came back to where the vessel was jammed, and there made winter quarters. We took some provisions out on the ice, for fear we should have to leave the vessel. After some days the ice broke up again, and we steamed up to Polaris Bay, and lay there at an anchor, and the next day steamed up a little farther on the coast to find a better place to lay. We took provisions out on the ice, put up an observatory, &c. Captain Hall then went to the north with Mr. Chester, Hans, and Joe; they were away about a fortnight, and then came back, all in good health. We were banking the ship. Captain Hall shook hands all round, went aboard, got some coffee, and ordered some for us, and we went about our business again. The next day he was taken sick. He was sick, I believe, about 13 or 14 days; I learned of his sickness from the officers. I saw him once while he was sick, during church service in the cabin. Once we sent a man aft to inquire after Captain Hall's health. He returned and said Captain Hall was pretty bad; not in his right mind. He died either at midnight or early in the morning. One of the men went aft in the morning and met Captain Buddington. The captain said, "Well, Henry, there is a stone off my heart." Henry said, "Why so?" "Why, Captain Hall is dead." We did not like that very well. After a few days we buried him, a short half mile from the ship. Then Captain Buddington took command, and we finished our banking around the ship, and went into winter quarters. As far as my opinion goes, I think Captain Hall died a natural death. Captain Buddington made fun of Captain Hall a good many times among the men. Captain Buddington was very friendly to Captain Hall till his back was turned. Captain Buddington was drunk very often. Captain Hall was a good man and a strict man, and wanted every man to keep his place. Anybody that did that could get along with him. At one time a consultation of officers was held aft. I saw them stand together. Captain Buddington did not want to go farther north, and he told Captain Hall he had better not go farther. So Captain Hall had a consultation about it. Captain Hall asked the opinions of all. Captain Buddington had no reason for not wanting to go farther. At the time of the consultation there was slack ice to the north, so that the vessel could steam farther. Captain Buddington then said among the crew, "Whoever wants to go north, let them go, but I won't." We were pretty comfortable in our winter quarters. We had a hole cut through the ice to make tidal observations every hour, and sometimes every few minutes, through the winter. The scientific people were in the observatory at work. In the month of November we had a heavy gale, and the ice broke up. The gale lasted, I believe, for forty-eight hours. In the morning pretty early the man said he could not make tidal observations. Soon the ice broke up. A short time after the ice broke up, and we drifted alongside of a berg to the starboard. When it cleared up we looked out and saw the berg. Volunteers went up and made fast an anchor to the berg. After that we got the wind from the southwest, and the ice being pretty stout inside of us, and the berg shoving in on us, jammed us pretty hard, the vessel heeling over and lying on her beam-ends. There was a heavy pressure upon us, making the vessel's

beams crack. The line we had fast forward one of the men tried to slack, because we were afraid of the berg. Captain Buddington came forward, feeling his way. He was drunk. He ordered, "Don't slack that line." In a little while he said, "You may go below; the ship is all right." After some time we went out on the ice, and had a look at the vessel. The vessel seemed all right. By and by I asked Joe, "Where is Captain Buddington?" Joe said, "Captain Buddington is asleep; very drunk." Joe fetched along a couple of barrels of seal-clothing, and Hans took some clothes and his whole family to the observatory, where Mr. Meyer was. They remained off the ship till next day. The officers and men forward wanted to saw the ice away and pull the vessel off the berg, but Captain Buddington would not do anything. The vessel was then lying on her beam-ends on the berg. Captain Buddington, after a while, gave orders to dig holes in the ice, and try to blast the ice with powder, but we could not do it. I said to Captain Buddington, "I think we can prevent the vessel lying over in this way. We can take ice-tackles and pull the vessel up straight, so that the ice shall make under her, and let the vessel get straight." In the spring the ice commenced to melt on top. We found that planks on both sides four feet above the stem were split. We took the sheet-iron off, calked it up where it was split open, and nailed the iron on again. She had rested on the foot of the berg all winter. The berg had grounded, and when the berg floated with the tide, the vessel floated with it. I don't think a better ship could be built for the purpose. The only fault I could see with her was, that she was not a good sailer. She went ahead well with the wind abaft. Not many ships could stand what she did. The Polaris went against a piece of ice like one berg going against another. In the month of July the expedition in boats was made to the northward. We started from Cape Lupton at a favorable opportunity. I was in the boat with Mr. Chester. We launched our boat and started; made a little distance, when the drift-ice made us haul up on the ice. We transported our boat over the ice, and launched it on the other side; then made another distance, and had to haul the boat up again. There we put up for the night. During the night we were aroused suddenly by the floe coming in upon us. Mr. Meyer and Mr. Chester were separated from us and went toward the shore. The piece of ice which held the boat was mounted by another, and we lost the boat. We saved some clothes, chronometer, &c. We found some drift-wood at Newman's Bay, on the southeast shore. I found a piece about two feet long and six inches in diameter; I do not know of what kind of wood. Several similar pieces were found. I think it was a branch of a tree. I found it on the beach about one hundred yards from the water, probably washed up there by the sea in the spring tide. There were no marks of tools upon it. After a while they sent for us to come back to the ship. We found that she had broken out, and made considerable water. The leak was forward where we had repaired her. You could see the water spouting in at about the six-foot mark. The deck-pump was going. After a while the leak was stopped a little. We had thought forward it was needless to use the deck-pump, and thus waste coal. No effort was made to stop the leak. Captain Buddington would not accept our suggestions for doing so. Before we started on our journey to the northward, Captain Buddington said, "I guess when you come back you won't find the ship here." We did not care, for we did not expect to find the ship there, but that she would go south, and we expected to go south in the boats. While Captain Hall lived we had good discipline. After he died everything went backward. We steamed

to the southward. Sometimes we laid for a day tied to a big piece of ice, continuing to drift to the south. After we passed Rensselaer Harbor, the pack we were fast to brought up against the Greenland shore, and the vessel was heeled over on her beam. Captain Buddington gave orders to heave the stuff over. Some of the party jumped on the ice to take the provision away from the ship. After a while I saw the ice slack off. I sung out to Mr. Chester that the lines were getting slack. He hauled the lines taut. We started to transport the provisions farther from the ship, and thought it was rather careless to be on the ice without boats. I sang out to Captain Buddington to lower the boats. I sang out for a dozen times. By and by he answered, and lowered the aft and then the forward boat, and we pulled them to our side. Hans's little girl laid down on her skin by the boat. All at once we heard a crack under the boat. At the same time the vessel's stern swung off. Captain Buddington sung out to haul the boats up on the higher ice, and take care of them. I helped the little girl over the crack. All at once the line slacked, and off the ship went. Captain Buddington sang out, "Take care of the boats, and I will take care of the ship." The next morning we saw a good deal of water around our floe. We started with our boats, and tried to get in shore; but half way from the shore we had to pull the boats up on the ice. In a little while I saw the vessel. All looked and said, "Yes, that is the vessel." She was off 18 miles, and was coming down very fast. We were very glad to observe she was coming to us. We put up an oar, with an India-rubber blanket, to attract her attention. When about 4 miles from us we could see the ship steam in-shore, and pass to the northward of the island. We all felt pretty bad, and we thought the best thing was to try to get to her. We pulled the boat about half the distance, and got it into the water; but the drift-ice prevented us advancing. We then went back to the other boat where our provisions, &c., were. In the morning we found that the boat we had left, and six boxes of bread, were gone. We remained on this piece a couple of days, when one morning we recovered the boat we had lost, provisions, &c. We lost a considerable amount of provisions in attempting to get ashore, and afterward concluded to remain where we were, and not risk losing all that we had. We were then on the original floe, and we staid on this and its pieces till the first of April. We then took to our boats, and worked our way toward shore. Whenever we got a chance to go westward we did so. When we could not get through the ice we remained on the best piece we could find. We got on one large floe which was broken up under us, the sea sweeping over it, and we had hard work to keep the boat and ourselves on the floe. The sea would sweep over the floe, bringing with it large blocks of ice, and we had to fight with these through the whole night. We thus worked our way slowly to the westward toward shore. We were often scant of provisions, but when we could get to clear water we got a good many seals. One day, about the 20th of April, we had about a quarter of a pound of bread left, and we made up our minds to come to the seal-skins, but on that day we caught the bear. The bear was a short distance off. Joe discovered him from the top of a hummock. We all kept quiet, and laid down, so that the animal should not see us. We left it to Joe to watch him and try to shoot him. Joe did so, and killed him. We got a line round his neck and pulled him to us. It was about the best supper I ever had in my life. We were picked up the last of April, in the morning, about 20 minutes to 5. A few of us were in the boat, and a few of us outside, be-

cause there was not room for all in the boat. In the morning I saw the sail. Joe and Hans were asleep. I called them, and they assisted me to attract the attention of the steamer in the distance. We sang out to her, and fired our pistols, and Joe and Hans their guns, and put up a flag on our boat's mast. Then the vessel came toward us. Hans went to her with the kyak. It was foggy, and once I lost sight of the vessel. Then it cleared up, and the vessel came close to us. We gave three cheers, and they returned them from the vessel. We launched our boat and went aboard. The first thing we asked for was a pipe and tobacco. We were not hungry, having had plenty of seal-meat the day before. On board they gave us some coffee and clean clothes. The Esquimaux families were at first taken and put to sleep among all the men, but the captain finally gave them a place by themselves. We were sick after coming on board; had skin-disease and coughs. Hannah was particularly bad. I have no doubt but our separation from the Polaris was purely accidental. However, if Captain Buddington had sent somebody to fasten the bowline more securely, the line would have held. I think if there had been any boat on board the ship, she would have come to us the next day, as the ice was drifting in our direction, and she had steam and canvas to help her. My theory is that the vessel had got a big leak during the night, and therefore they did not dare to come to us, but could only make for the shore. I do not think the vessel will be able to come out without assistance. She only had thirteen or fourteen tons of coal aboard when we left her—just enough to last her for the winter.

Examination of Gustavus W. Lindquist.

Was seaman on board the Polaris; am 26 years old; I was born at Stockholm. I joined the Polaris at Washington and sailed with her. Nothing of importance happened between Washington and Disco. At Disco there was a little misunderstanding between Captain Hall and his officers. I did not know it for certain. I don't know whether it was in the scientific corps or sailing department. Captain Davenport came on board, spoke to the crew, and bid us all good-bye, and also Dr. Newman. I heard of no disturbance after that. From Disco we sailed to Upernavik, thence to Tussuisak, and thence steamed north. I did not keep any record of the voyage. In coming through what I understood to be Melville Bay, we found some ice. A little further to the north we found open water again, and then again a little ice, till we got as far as Cape Alexandria, and, at Cape Hatherton, open water as far as the eye could reach. That night we steered off to the west, and were the next morning off what I believe to be Cape Frazier. We then steamed north again, and encountered some ice, very slack, and from there we found open water to the north, through Kennedy Channel to Cape Constitution. We advanced the whole of that night, and the next day found foggy weather, and hove the lead, but with no soundings. Toward noon it cleared off, and we steamed on again. We steamed a good ways through Robeson Channel. The weather was misty, and we could not see a great way. Then we turned back for winter quarters. At the time we turned back I came on deck at 8 o'clock. It was my first look-out, and I relieved the man at the cross-trees. They had steamed back then two hours. About 10 o'clock we were beset in the ice. We got away from there again, and got in toward the Greenland coast, and Captain Hall looked again for winter quarters, but there was no

place. There was here a heavy current. This was to the north of Newman's Bay. Then we got out and got fast in the ice, and drifted south, I don't know how many days, till the weather cleared up, and we made ice to the east of us, and a big iceberg as a shelter, called by Captain Hall Providence Berg, for our winter quarters. We named the place Thank God Harbor. There we put provisions ashore, changing their position afterward to the top of the hill. We were just through when Captain Hall started on his sledge journey. During his absence we were engaged banking the ship up on all sides. When he came back he shook hands all around; he looked very well. I looked particularly to see if the weather had had any effect upon him. We had thought the weather rough for Captain Hall and his party while they were out; I did not observe any signs on Captain Hall; I did see him again before his death. I heard he was out of his mind; I heard the disease called apoplexy. When Captain Hall departed on his journey, the weather was four degrees below zero. Captain Hall died on the 8th of November. We buried him on the 11th. We were two days digging his grave. I believe he died a natural death; I never had any other belief. If I had any other belief, I would speak it out. I know there were men around that did not like him, and whom he did not like, but, at the same time, I believe he died a natural death. I do not think he was very fond of any of the scientific department, except Mr. Bryan. Mr. Bryan was liked by everybody in the ship. Everything in the ship we were told to do we did. I know of no open difficulty. There was good discipline while Captain Hall lived, but we put discipline along with him in his grave; but there was no mutiny or difficulty of that kind. Captain Hall had divine service every Sunday, and every morning after we got into winter quarters; that ended after his death. Captain Buddington then took command. During the winter nothing particular happened till the 27th of November, when the ship got adrift. When I came out on the deck I saw the ship loose. It was very dark. I had no boots on my feet, and went back into the forecastle. I said, "Boys, we are going to have something." I put my boots on, and I was going out to save the boats on the ice. Another man came down and said the boats were adrift. When Captain Buddington heard she was adrift, he ordered the other anchor to be let go, but he found there was no strain on the chain. Captain Tyson tried to discover the berg, but there being a heavy snow drifting, and the berg being white, it was not to be seen, although we were within twenty feet of it. When Captain Buddington found we were alongside of the berg, we made lines fast to it. The next day the weather moderated toward evening. We could then have got out lines and have got back into the same place, but there was nothing of that kind done. Then we had a calm and very cold weather, and it froze and formed young ice between us and the shore. After that there came a southerly gale, with a heavy pack of ice, and shoved the berg, so that its foot came under the ship. There she lay all winter on the foot of this berg, rising and falling with the tide. There was nothing of importance during the winter. We had heavy northeasterly gales. Two or three hours after every gale we could see open water to the southeast of us. Toward twilight we used to go out to Cape Lupton. There we used always to see open water. We reported to the officers that we had seen open water. We thought that we should have some chance in the spring to go north in boats. When spring came our path was all blocked up by the ice. In the month of March the doctor started on the sledge journey to the south. Mr. Bryan and the two Esquimaux went with him. In the month of

April the two Esquimaux went out hunting by themselves and shot seven musk-oxen. After that Mr. Chester started out. He was away two days. He shot two musk-oxen. During this month we were preparing our boats to go north. In the month of May we could not do anything. We could not work the sledge over the ice because it was on the move, nor the boat through it. In the month of June we started, but the first boat got smashed up. Mr. Chester had charge of that boat. Mr. Tyson had charge of my boat. We got twenty miles from Cape Lupton, where we started, and then had to pull the boat up. This was at the mouth of Newman's Bay. We remained there about a week, till Mr. Chester came up from the ship. To the northward was heavy ice. Close in shore there was a channel leading to the ship, but to the north nothing but a packed mass of ice. After Mr. Chester got to Newman's Bay with his boat we laid for about a month. Mr. Meyer and Dr. Bessels took observations. I did not see any drift-wood at this time, but after we had gone to the ship and abandoned the boat, some of us returned for the lost property, and then I saw drift-wood. It had been gathered on the beach by the other men. In Polaris Bay we found an Esquimaux sledge-runner, and traces of Esquimaux. We found that Esquimaux had lived there. When we got back to the ship all hands were put at the pumps to save coal. We used only the donkey-pumps, and kept her free with ease. We pumped for a few months every hour. We laid there till the 13th of August, when we started to go south. We left here, ashore, by accident, a Newfoundland dog, one of the best dogs we had. We were very sorry to lose him. After leaving Polaris Bay we got as far south as latitude 80° 2′, where we were beset by the ice. We made two or three attempts to get through and steam south, but we could not get through. We lay beset in the ice till the 15th of October, when we had a gale from the south for four days. Toward morning it moderated. On one side of the floe we were made fast to was young ice, but this young ice, which broke up, was replaced by heavy ice, which came up against us, and the ship forced over on her side. When the ice pressed her timbers began to crack, and everybody was in a panic. Captain Buddington himself gave the orders to heave the provisions on the ice, and "Work for your lives, boys!" After getting all the provisions out on the ice, the ice outside of us slacked up, and the ship got upon her keel. The last thing I did in the ship was to shove a big molasses barrel out on the ice. Then I went into the forecastle to look after my clothes-bag. Our clothes-bags were always kept ready packed for emergencies. I had, however, just taken something out of mine, and I wanted to replace it before I started on the ice, but I could not find it. I then went up, and stood at the gangway of the ship, and started to go on the ice, on which the provisions were placed. About two fathoms of small ice intervened, and I could not get out to the clothes-bags. The rest of the men were out working, and Captain Buddington said, "I don't see any need of you out there now." I said, "I would like to get at my clothes-bag." "Well," he said, "go ahead." The bow-line was taut, so I took this means to get out on the ice. After I had been two minutes on the ice it broke up, and the piece which held me and most of the provisions went off. The most of the provisions was on one piece of the ice, and the boat and Hans's family were over one of the cracks. It was widening out, and we were just attempting to get the boats and Hans's family off when the ship got away. We could not tell for certain how the ship got away. If the line had broken there should have been a piece left in the anchor, but there was none. The ship was at this time going fast, and

if we had attempted to get to the ship we should have drowned. If we had had a line from the ship's side I might have made an attempt to get it to her. I could not see anybody on the ship, but I heard Captain Buddington's voice crying, "Stay where you are;" and the last word we heard him say was something about the bow-line. I think if any one had attempted to get to the ship from the piece I was on, they would have drowned among the loose ice between us and the ship. Captain Tyson then launched the scow, and tried to come to our floe, but the scow was swamped. Then he launched the boat, and came and took us to the big floe, where were the rest, with the provisions we saved. Then we piled our stock together as well as we could, and turned in on some skins and clothing. My clothes-bag was not to be found, but we found other clothes-bags, so all had enough through the winter. We found the clothes-bag of Joe Mauch, Henry Hoppy, Herman Simmins, Noah Hayes, and Walter Campbell, fireman. These bags did not contain all the clothing of the men, only that part which had been put in the bags to be thrown on the ice in case of accident. There was more clothing on board the ship, and, besides, every man that was on the ice had left some of his own clothing in the ship. Next morning we tried to get ashore, but had to stop before we reached it. We saw the ship steaming down. We thought she was coming down to us. She was under steam and canvas. We set up an India-rubber blanket on the ice to attract attention. After we had been in this place for about an hour, we found the floe we were on to be going south rapidly. Toward afternoon the part of the floe we were on went out from the shore, and left a piece of open water between us and the shore. Captain Tyson proposed we should get ashore with our boat. We launched our boat. We had only three oars and no rudder. It did not look as if we should get ashore. Night coming on, we left this boat on the edge of the floe. Next morning the floe broke up, and the boat got away from us and was absent four or five days. Afterward we picked it up. After trying three times to get ashore, and leaving one of our boats and canvas house on the small piece of ice, we finally got back to the main floe on the first day of November. About eight days after we fell in with the piece and got back our boat, with the canvas house and the provisions it contained. The wood of the house we saved and brought to the floe we were on. We floated on this till the first of April. On the first of March it had broken up into smaller pieces, but left us the piece on which we had built our snow-houses, and we still lived on that piece. We had built four snow-houses, and lived in them during the winter. About the first of April we abandoned this floe and started to work in toward shore. We worked whenever we got a chance. When we could not make any progress we got on as large a piece of ice as we could find. We lived largely on seals, which were killed by the Esquimaux who were with us. If it had not been for Joe, who is a great hunter, we would have been badly off. Hans tried to do all he could, but he was not the man Joe was. On the night between the 19th and 20th of April, a gale was evidently blowing somewhere, from the heavy swell it produced with us. The sea came clear over us. once the boat was washed off the floe, but we all clung to it, and while doing so I could feel nothing under my feet, and thought we should drown. Then we pulled the boat up and made it fast to the small piece of ice. Toward morning a little piece of ice came floating by, and Captain Tyson said we had better get on that piece. It was a very small piece, but strong enough to hold us, and floated easier on the sea. The next day we had eight or nine biscuits for the whole nineteen of us.

This was when we caught the bear. We had got one in the month of March, but this came just in time to relieve us. Joe killed him. Of the seals we got during the winter we ate all. We threw away nothing. After that we had rainy weather for four days, and every one of us suffered. The rainy weather seemed harder on us than the cold. We were picked up by the Tigress on the 30th of April, and brought to Bay Roberts, and then to Saint John's. No one was drowned when the ship went adrift. All on the ice were saved, for I was the last one that left the ship. The ship did not leak at that time more than she had for a considerable period before. I saw the ship next day. We thought she was intending to come for us, but she did not. I think they could not have failed to see us, because they had the mast-head to see from; but I don't know whether the condition of the ship was such that they could have done so. They might have thought it was easier for us to get to them. I don't think the ship will be able to get out without help, because she has little coal, and under canvas she cannot pass through the ice. I think the parting between us and the ship purely accidental, but if they saw us the next day, and whether Captain Buddington was careless about getting us again, I cannot tell. I saw Captain Buddington drunk once in Kennedy Channel. That was the night we were beset in the ice, in 80° 2′. He showed it by speaking loud and giving improper orders. The next morning he had some words with Dr. Bessels. I did not keep a record.

William Linderman, seaman, examined.

Born in Germany; 23 years of age; joined the ship at New York. From Disco we went to Pinacle, where we stopped couple days. From there to Proven, to get Hans's family of Esquimaux. From there we went to Tessiusak to get seal-skins to make clothing of. Then went up Smith's Sound; we came over to the west coast, where we landed with a boat to find a place for winter quarters, but steamed up again, and through Smith's Sound, into Kennedy Channel. A little above 82° we landed again, trying to make winter harbor. The ship was then in latitude 82° 16′, as reported from the scientific corps. We were stuck in the ice, and drifted down into Polaris Bay, where we had our winter quarters. The ice came in on us, and we had to put provisions on the floe. We landed provisions in our boats, for some days, until the ice formed and was strong enough to bear our weight. When we had the provisions landed, we took the observatory ashore; it was a little four-cornered house, the frame brought from New York. Having set it up, we had to shift the provisions higher on the ice, so the snow would not cover them. Soon after this Captain Hall went a sledge journey to the north. He was absent about fourteen days. On the outward trip, a day or two from the ship, they shot a musk-ox. They buried the meat in the snow, and brought it aboard the ship when they came back. Captain Hall, and the men with him, were all healthy and well when they came aboard the ship. We were all outside, banking the ship. He came up to every one, shook hands, and asked how we were getting along. He then went into the cabin. Next morning it was reported that Captain Hall was sick. I didn't see him until the next Sunday, when I came into the cabin for church; he looked very sickly, but didn't say a word. That was the last I saw of him alive. Captain Buddington came forward to tell the carpenter (whose name was Coffin, I think)

to come and help make the coffin. When the coffin was finished, we brought it aft. Captain Hall was lying in the cabin, on two chairs, just as natural as when alive. We put him in the coffin. I have no reason to suppose he did not die a natural death. After complete darkness set in, we got a gale from the northeast, the ice broke up, and we drifted alongside Providence Iceberg. Captain Buddington came forward, and asked me if it was possible to get anchored on Providence Iceberg; I told him I would try to. He says, "I will give you Hans and Joe to give you a hand." I took a hatchet and cut steps to climb up on the berg, took a line along with me. I hauled the anchor up on it. Then Hans, Joe, and Robert Kruger fetched the line up to me. The line was made fast on the ice on the berg, and made fast to the ship. An ice-anchor is an iron hook to put into the ice; the heaviest of these hooks we had was about 75 pounds. The rest of the men were busy making lines fast from the aft of the vessel to the iceberg. Toward dinner the wind moderated, and next morning it was calm. We hauled the vessel about one hundred feet ahead, alongside the berg. Some time afterward we got a gale from the southwest. The berg came crushing in on us and keeled the ship over on her beam-end. Captain Buddington came forward, and said, "Boys, you can go below; I think the danger is all over." Captain Buddington went aft again, and we staid on deck. Hans and Joe were busy taking their things ashore. Hans took his family ashore. Joe and Hans turned in and built two snow-houses on shore to live in. After the ice was four feet thick they tried to get the Polaris off Providence Iceberg. Tried to blast the ice with powder, but the powder had no effect on the ice. Then we tried to saw the ice, and to pick the ice down with pick-axes, but could not do it. The water came up and we could not do any more. When we saw that we could not get the Polaris off the iceberg, we gave it up. During the darkness we had nothing to do but fetch provisions off the ice; used to get enough to last us a week or two. We cleaned decks and fed the dogs. I have forgotten how many dogs we had; I think somewhere about forty. In the spring parties used to go out hunting. In June we started with our boats north. We had to fetch them up to Cape Lupton. There was no other place to launch a boat. Captain Tyson and Mr. Chester were lying there waiting for a chance to get up north. One day Dr. Bessels went back aboard the ship, and we waited his return to start north. Mr. Chester told Tyson he would wait no longer. He launched his boat and went off. He was about two miles north of us when he had to haul his boat up on the ice again and set a tent on the ice. One man was keeping watch. Early in the morning a heavy floe came in on them, crushing a piece away on their boat. Mr. Chester and his party came back to us again. Tyson asked him what the matter was. He told him he got his boat crushed in the ice. Mr. Chester and his party started for the ship. The next day we launched our boat and went up to Newman's Bay, where the ice came in on us, and we had to haul our boat up on the ice. We passed by Chester's boat; it was only about six miles from the ship. I think it was about four miles from the ship to Cape Lupton, and about two miles above there he lost his boat. A couple days afterward Mr. Chester came up with his canvas boat. We launched our boats several times, trying to go up to Cape Brevoort, but could not do it; always had to haul our boats up on the ice again. Two of Mr. Chester's crew went aboard the ship for some more provisions, and when they came aboard the ship Captain Buddington told them that the ship was in bad condition, and that they had to stay aboard. They made

twice an attempt to force the ship up Newman's Bay, intending to fetch the boat aboard, and come south, but could not get through on account of ice. The last time, when the ship ran back, they landed these two men on Cape Lupton, with some provisions, and the ship went back to Polaris Bay. I think the men were forty-eight hours on the tramp before they reached the boats. They told us the ship was in bad condition. Next day Captain Tyson and his party and Mr. Chester and his party took Captain Tyson's boat ashore, and pitched the tent and staid there that night. Next day we started for the ship, reaching the ship in the afternoon. We walked back to the ship, being unable to get the boats back on account of the ice. Mr. Chester and Herman Seymour staid by the boat, trying to get it in-shore. It was Mr. Chester's boat—a canvas boat, built in New York—that was still on the ice. I think the next day they got the boat ashore. They returned that night to the ship, when all hands were aboard. We had to pump ship. Before they had pumped with steam. Captain Buddington asked me several times if it was possible to stop that leak. I told him that if she had water-tight compartments it would be possible to stop the leak. The carpenter and I worked on it several times, but could not stop it. In the aft of her bow was a water-tight compartment, and that is where we thought she had a leak. Her stem was broken. When we had everything fixed, we could raise the water about three feet higher. The forward hold and main hold were so full of water that it was necessary to let the water run out where the pumps could get at it. There was a little provisions spoiled. There was another compartment in the fore part of the ship that got full of water. The next compartment under the main hold got almost full. This happened while I was up at Newman's Bay. Captain Buddington sent Hans and myself overhead to see if there was any chance to go south. The last day we were in Polaris Bay Captain Tyson was up in the mountains, and reported some leads of water. That afternoon we got up steam and started south. We worked our way down through the ice to Cape Constitution, where we were stuck for some days, but we drifted south all the time. Then the ice opened again, and we worked our way through. We got as far south as Humboldt Glacier, I believe they called it, where we were stuck, and had to make our ship fast on the floe. Every time the ice slacked up a little, we tried to get south, but did not get very far. We had to make the ship fast to a floe, where she froze in; we were drifting south all the time. When we came into the narrows of Smith's Sound a heavy gale set in; I think it was from the southward or southeast. We drifted back up to the northward. The floe to which the ship was fast fetched up ashore, and the ice came crushing in on her. Under the pressure of the ice the ship keeled over, and Captain Buddington gave orders to land provisions on the ice. That was done. We had got a lot of provisions on the ice, when the captain gave orders to knock off provisions over the side. He told us to transport the provisions on the ice, where they would be safe. It was done. Then he wanted the starboard line shifted. I got a ice-chisel and dug a hole a little ways up higher in the floe, and told them all was ready to shift the line. Then he told me to get some provisions up the hill. At that time the floe broke up, and the ship went adrift; it was dark, and we soon lost sight of her. When we came to look around, we found that I and three others were on the piece of floe, with the larger quantity of provisions, while Captain Tyson and the rest of the men and Esquimaux were on another piece, where they had both boats, a few provisions, rifles, ammunition, and a canvas house, with 11½ or 12 bags bread in it, a few

blankets, and some other things. On the piece we were on we had a little scow we had made in New York—a flat-bottom, four-cornered boat. Two of our men went in and pulled across where Captain Tyson was. Captain Tyson sent a man across; he came on the same piece of ice we were on. I sang out to Captain Tyson if I should fetch the stuff across when the boat came back. He didn't understand me; he hollowed back, "Come back with the boat as quick as possible." We jumped into the boat and rowed across. We laid away both boats, the provisions, and our guns up on the hummock, close alongside the canvas house. Then Captain Tyson said, "Go into the house and get six bags of bread;" that was done. Then we spread our skins out; laid ourselves down to sleep alongside the boats. Next morning we turned out and saw that we were close in to the shore. There was open water right alongside of the piece. Hans and Joe went a little ways in shore on the floe to see if we could get in shore with boats; it looked as if there was some young ice between us and the shore. Fred. Jaruka and I went in toward the eastern side of the floe. The floe was about one hundred yards off an island, though we didn't know then that it was an island. Fred. Jaruka went farther toward the northward, to see if we could get in shore with the boats. I went on the young ice. Was about twenty-five yards off the shore when we returned to the boats. Then Captain Tyson ordered us to fetch the boats down to the edge of the floe. We did so. We launched one boat first, and loaded her. Captain Tyson, the Esquimaux family, and some of our men went in that boat to try and reach the shore. They had pulled about a mile when they had to haul the boat upon the ice. The ice came and set in on them. We came shortly after them, and had to haul our boat up, too. The boats were about two hundred yards apart. We hauled both boats together, and I think it was in the afternoon when we sighted the ship coming around the point of another island. Could not tell how far she was off. Should judge she was about twenty-five miles off when we first saw her. We sighted her twice. Then she was heading down the straits, and again came toward us. When she came closer to us she set her canvas. Was steaming when we first saw her. We made signals. We used an oar with an India-rubber blanket on it. Should judge she was about four miles from us then, and close to the land. We thought she was coming to us. Saw no one on board. I think any one on the look-out should have seen us. I cannot say in what condition the ship was in. She steamed in behind an island. In the afternoon, about four o'clock, our floe went adrift. We drifted south. That evening we saw the Polaris between the island and main land; close into the main land. She had her sails down. In the evening a gale set in again. In the evening we tried to reach shore, but the ice came in on us, and we came nigh losing a boat. We got on the floe. All hands were tired out, and not able to get our boat back where the other one was. We left it, and returned to the other boat, where were our provisions and tent. We set our tent, and went to sleep. Next morning the piece we were on broke off the floe, separating us from one of our boats, some provisions, and the canvas house. We could not secure the boat. It was blowing too hard. Next day we started to build snow-houses. Caught a couple of seals. Some days afterward Joe was on the hummack with Captain Hall's spy-glass. He discovered the boat and the canvas house. I asked Joe if the ice was strong enough to get across; Joe told me it was. We started to the floe where the boat was, with a few dogs. We got up to the boat. We got six bags of bread out of the canvas house, took it in the boat, and started back for our snow-houses. We got back in the

afternoon. I think it was next afternoon we started back again to the main floe. Joe and Hans turned to, and made a sleigh. Next morning we started across again. We broke the canvas house down, put as much wood as we could get on the sleigh, some canvas, and went back to our snow-huts. Next day we started again to get some more wood and canvas. Next day we started again; there was then little wood, two bags, poles, and a little canvas left. The rest of the men were out looking for provisions; but they couldn't see anything. Then we turned to and built a cook-house out of canvas. We cooked the little grub we had with wood. Couple days afterward Captain Tyson sent Hans and Joe toward shore to find a road—passage for our boats. Hans and Joe came back and reported that they had been ashore on the island. Captain Tyson then told us to have everything ready to make a start inshore after the spring tide was over. We started across with a boat for our provisions, some clothes, some musk-ox skins, and some of our ammunition. We started back a little piece, to the floe where we had fetched the boat off couple days before. Toward the shore, we left her there, and went back to our snow-houses to get the other boat, the rest of the provisions, clothes, skins, ammunition, and rifles, and started across back to the main floe—the same floe the ship had been lying on all the time. We started across again with dogs and sleigh, to get the few things we could not carry in the boats. We loaded the sleigh with a couple trunks, couple sticks fire-wood, little blubber, and went off again to the main floe. Next morning Joe started with team of dogs to fetch fire-wood; he was gone a little while, and came back and reported that all the ice was broken up. We went across again on the broken ice, and found the piece containing our snow-houses. We got some clothes and a rifle. William Jackson and I then started off with a team of dogs. We found Hans with a team of dogs coming back where our snow-houses were. They went back to the boats, and told us the ice was broken up. We went ahead. When we came to the broken ice we left the dogs and sleigh standing there and walked across the broken-up ice. Light snow was falling. At last we found the piece our snow-houses were on. We fetched the kyak, Captain Hall's rifle, some carpenter tools back over the broken-up ice. When we got over the broken-up ice to the fast ice again, two of our men took the kyak, and William Jackson and I took the boat. They brought back the team. Then we were all on the main floe again, and that was adrift. When we got on the main ice again, we built snow-houses, and lived there all winter. We were on that piece for five months, until the first day of April. On the first of April we started with our boat for shore. The floe, which had originally been a mile and a half across, had now got reduced to about 30 paces across. We abandoned this on the first of April, and endeavored to work west with the boat we had left. The other boat had been broken for firewood in the winter. Whenever we got a chance to work westward we would do so in the boat, and when we could find no opening that we could get through, we landed on the best piece of ice we could find. We lived principally on seals, which the natives killed whenever there was open water. Toward the last of April we found very few seals, and got very much reduced in provisions. We got reduced down to our last biscuits. We had three and a half loaves bread left for nineteen persons for our last meal. Joe and I went up higher on the hummock to see if we could find an opening. Looking westward we saw something move; I told Joe it must be a bear. I first thought it was a loose cake of ice. All at once he lifted up his head, and Joe let drive at him, and shot him right in the head. Couple

of days before that we came very nigh being lost; a heavy swell washed over us; we couldn't do anything but hold to the piece we were on. The children were in the boat; the women were outside with us; we could not have them in the boat. We were pretty much played out; the water washed over us all night; we had no dry clothes to put on; had thrown everything away. A few days after this we were rescued by the Tigress, as has been described by the others, and brought into Bay Roberts, and then into Saint John's. The dogs we had on the ice we had to shoot, except two which we kept alive by giving them skins which we had; one of them died.

Question. Do you think the separation of the ship from you was accidental?

Answer. Yes, sir.

Question. Do you think she could have come to you?

Answer. I can't tell whether she could have got to us or not, without knowing the condition of the ship. I think she could have got to us if she had been in good condition. I don't think she will be able to come down unless she gets some help. I am willing to go after her, and I think the rest of the men are willing to go.

Question. Do you know if any of the officers ever got drunk?

Answer. I do not; I am no judge whether a man has got liquor or not. Never saw any one drunk.

Question. Did you find any drift-wood?

Answer. Some of the men found some drift-wood. In Polaris Bay, on the southeast shore, I found a piece of drift-wood about three and a half feet long, and about as thick as my arm, without bark. I think it was some kind of soft wood; I could not say if it was a branch of a tree or not. It was a straight piece; it was very much worn. A little farther in shore I found another piece about a foot and a half long; this was about two miles south of our winter quarters. The biggest piece was about one hundred feet from the water; the other piece was about half a mile from shore, in a ravine; both pieces seem to be the same kind of wood. Then I found a sleigh-runner up on Cape Lupton, on the water's edge.

Examination of Peter Johnson, seaman.

I am 33 years old; was born in Denmark; have been in this country eight or nine years. Am one of the crew of the Polaris, and sailed with her from New York. I joined her here in Washington. We left Upernavik about the middle of August, 1871. I don't know anything about charts; but after leaving Upernavik we sailed along pretty much following the land. We stopped at Tussuisak. We went up through Melville Bay, up through Kennedy Channel. We went on the west side, going up through Smith's Sound. We were on the west side most of the time until we came to what has been called Kane's Open Sea; it was a bay; we could see land on both sides. Captain Hall called it Polaris Bay. After we got through this we went into another channel; Captain Hall called that Robeson Channel. After we got into winter-quarters Captain Hall went north on a sledge-journey. We had been up higher, but had to come back to go into winter-quarters. Captain Hall was gone about two weeks. After he came back to the ship he took sick right after, and in about fourteen days afterward he died. He died in the morning. I was called up about 9 or 10 o'clock that morning. I saw

Captain Hall when he came back; we were outside banking up the ship by putting snow all around us. He looked well; came up and shook hands with all of us. I did not see him again until we went into church next Sunday. We did not have church that Sunday; he was too sick. We had church every Sunday as long as he was alive, except this last Sunday. The services were conducted by Mr. Bryan. I did not see him at any other time when he was sick, and do not know what was the matter with him; they said he was out of his mind; everybody that went to see him said he was out of his mind. I believe Esquimaux Joe, Hannah, and Mr. Martin attended him while sick. We buried Captain Hall on the 11th of November. I have no reason to believe that he died from any other than natural causes; he didn't show any signs of anything being wrong; he looked quite himself; he looked just the same as when alive. I never heard anybody say he had been poisoned, and have no reason to believe anything of the kind. He used to say somebody was going to shoot him. They said he was not in his right senses, and that he did not know what he was saying. After Captain Hall died we didn't do anything. We didn't have any sun; it was completely dark. We were in our winter-quarters in Polaris Bay. In the latter part of winter a gale of wind struck us, and we drifted down alongside an iceberg, when we got a line and tied her fast. She lay on the spur of the iceberg with her bow; she lay on this iceberg all winter; we could not get her off, and the tide rising and falling strained her stem so that she leaked considerably when she broke out, which was not until the latter part of June. We were away in boats when she broke out, and I do not know exactly what day. They had to keep steam-pumps going to keep her afloat. After we got back we kept her afloat with the hand-pumps. We were up in Newman's Bay, about 20 or 22 miles from the ship; cannot say correctly about the distance, but it was longer by boat than it would have been straight across. I think we started the 1st of June. I went in one of the boats with Captain Tyson; Dr. Bessels was in our boat; Mr. Meyer was in the other boat with Mr. Chester. We had twelve men with us in the two boats, six in each boat, including the officers. We were waiting for a chance to go north, but the ice drifted so thick and heavy we could not get through it. The scientific men took observations when they could—whenever the sun was out. The doctor didn't do much of anything; he was snow-blind most of the time. The temperature up in Newman's Bay was always below freezing; it was not very cold in the summer. There was not very much snow on the ground. There were a few flowers growing in a sort of moss. I do not remember seeing any timber floating in the bay. I found some small pieces of drift-wood, about as large as my arm; could not tell what kind of wood it was. No wood grew there, except a few scrawny willows; some specimens were brought aboard the ship; do not recollect seeing any except this I have described. From where we were we could see up through the channel. After it got through, the land ran east on one side and northwest on the other. We could not see land across to the north of it; could see land northwest as far as we could see. We left the boats there; one of them was stove in. Mr. Chester was a mile or so ahead, when a heavy floe came in and broke his boat. We were up in Newman's Bay about thirty-seven or thirty-eight days, when Hans came back and told us they could not keep the ship afloat. We walked back to the ship. She started south. Some time in the first part of August, we tied up to a piece of ice, and drifted along for about two months. The leak in the ship didn't make so much water. We kept her clear with the little

hand-pump. We kept relieving each other; three or four men used to pump at a time. On the 15th of October it was blowing hard from the southeast. We were working at the pump. We heard a crash, and, looking out of the window, we saw the ice coming in on us, and told Captain Buddington. He called on all hands to get the provisions overboard. Some of us went on the ice. The wind was blowing a gale, and drifting the snow, while we were on the ice. All at once the ship broke loose. I don't think it was more than five minutes before she was out of sight. I was on the main piece of ice; some of the men were on the small pieces, and had to be brought off on boats. We got all together on one piece. We lost most of the bread and provisions, because we tried to save our boats. We only had one sled-load of provisions; that is all we got off. In the morning we tried to go on shore; we got about half a mile, but could not go any farther on account of the ice. In the afternoon we saw the ship some miles off; we could see her quite plain. We put up a black rubber blanket on an oar; thought they would see us, but she steamed in behind an island, and we lost sight of her. I don't know what condition she was in; she had probably been drifting about all that night. It would take about five tons of coal to get up steam, and she could not have had many tons left. She had a large break in her stern. We tried to get to her that evening; we were pretty well played out; the ice came setting down on us, and we could not get back to the place we had left. Next morning we lost one of our boats, but ten days afterward we found it. We finally floated off and lost all trace of the ship. One of the boats we afterward cut up to burn for fire-wood during the winter; the keel of it we put under that of the other boat, to save it from being stove up when we drew it on the ice. We were on the ice 197 days—from the 15th of October until the last of April. We were on one floe about five months, I think. When we found we were going out into the sea, we left the piece we were on and tried to get on shore; we would land on a good piece of ice until we got a chance to go westward; when we could not go west we tried to go south. I do not know how many different pieces we were on altogether, sometimes two or three in one day. One time we were fourteen or fifteen days on one piece. We got near out of provisions; had only a little bread left for supper. That night we caught a bear. We caught plenty of seals until we got jammed up in the ice, when we could not get at them any more. We were picked up on the last day of April. On the 28th day of April we saw a steamer; she came steaming down from the southward, about southwest. We saw her smoke. We watched them until it was so dark we could not see them any more. We set watch. Next morning we saw the steamer again, about four or five miles distant. We made signals to her; hoisted up blankets; got up on high pieces of ice; there was some shoved up by the sea; we got all the fire-arms we had and fired them all at once, hoping they would hear us. After we fired three times we heard them fire, and thought they had heard us, but could not get to us. Soon after they steamed away out of sight, and we gave it up for lost. That night we kept up a fire all night; we rolled up the canvas with some blubber we had and kept up the fire all night. Next morning at five o'clock we saw the ship again, and we hailed her. There was also another steamer coming from the other side, about five hundred yards off. We were rescued; we got into the steamer, got a smoke and something to eat, and they brought us to Saint John's. We lay in Saint John's three days. I cannot say if the steamer came down home on account of us or not. They said one of their boilers gave out; they

could not get steam only in one boiler. I think they came down because he could not get back to the sealing-ground. After they got us they caught 270 seals; don't know how many they got on the voyage; think 7,000. I do not think the people on board the Polaris meant to abandon us. I think they had some reason for not coming to us; perhaps the ship was in such bad condition, or it may have looked to them as if we could have come to them. It must have looked from the ship as if we were close to the shore. I think she is in a good place to get out, and if she only had coal enough she would come home, but she has very little. If she has any more leak than when we left her they won't be able to keep her afloat. They are pretty near shore, and there must be natives close to them. We never saw any of them. I don't know anything about any difficulty aboard the ship—nothing of the kind. I heard the officers aft didn't agree very well, but did not see anything. I have seen Captain Buddington when he had a little too much; could not see it on any of the rest of them. The night we lost the ship Captain Buddington was all right; there was no liquor on the ship then.

Question. Do you know of any other difficulty in the ship?

Answer. No, sir, not any; we had good rules on the ship so long as Captain Hall was alive; not so good after that; there was not so much rules after that.

Question. How was it on the ice?

Answer. We got along well enough; didn't have much to eat; we didn't know much about rules on the ice; it was not the place to think much about it. When Captain Tyson told us to do anything, we always done it; and when we didn't we found out it didn't turn out well. When we were picked up Captain Tyson said we were only about twenty-five or thirty miles from land. I kept no record; kept a note-book on board the ship, but it was left in the ship.

Fred. Aunting, seaman, examined.

I was born in Russia, on the Prussian border. I joined the Polaris at Washington. After we left Disco we went through Smith's Sound, then up Kennedy Channel, past Cape Constitution, and across what was called Kane's Open Sea, and found it to be a bay. Northward of that we found another channel or strait; we called the bay Polaris Bay, and the strait north of it Robeson Strait. The first cape on the Greenland side, above Polaris Bay, they called Cape Lupton. There was a bay northward, making out of Robeson Strait, which they called Newman's Bay. We went in the ship up Robeson Strait to latitude 82° 16′; that is what the scientific men told us was the latitude. We did not go quite through the strait, but could see through it; we could see where the land above us made off to the eastward, also to the west. From Cape Union the land broke off to the west; on the other side it commenced to break off from Cape Brevoort, on the Greenland side. It seemed as if the land made off southeast. We could see land on the other side make northward as far as we could see. After we reached the highest point, the ship was driven back before the ice by a northeast gale. After the gale there seemed to be open water to the northward, but the ship did not go any farther north. We made several attempts to find a harbor in Robeson Strait, but could find none. We were obliged to make our winter quarters on the east shore of Polaris Bay, about four miles below Cape Lupton, in a small bay which Captain Hall

called Thank God Harbor. There we anchored under the lee of an iceberg, on the eastern side of the iceberg, between it and the shore. There we went into winter quarters, erected an observatory on the shore, put provisions on the shore, and began banking in the ship. After we got into winter quarters Captain Hall went off on a sledge journey. He started alone, with Joe and Hans and Mr. Chester, all in one sleigh, but afterward sent one of the Esquimaux back for another sleigh. They went across overland to Newman's Bay, and then across the bay to Cape Brevoort. They were gone about two weeks. They went in the early part of October. I shook hands with Captain Hall when he came back; he shook hands with all of us; he seemed very well. He went aboard the ship, and the next day I heard he was sick. I never saw him again until after he was dead, and I don't know what was the matter with him; they said he was delirious. I helped bury him. All of the ship's company were present. The services were read by Mr. Bryan. He was buried about half a mile from the ship, to the southward of the observatory. After that Captain Buddington took command of the ship, and we lay in winter quarters all winter; the scientific men kept up their observations all the time. Some time in the month of November, after Captain Hall's death, the ship broke adrift, and we went up alongside an iceberg. There we were made fast, and were frozen in. Next morning there was a calm, and there was open water back of where the ship was lying before, but the ship was not moved back. I do not know why. Pretty soon we were frozen in again, and we anchored fast in the iceberg. The iceberg put out a spur under the bow of the Polaris. We had several gales afterward, and the foot of the iceberg was driven under the stem of the vessel. She lay there all winter, with her stem on the foot of the iceberg, and her stern rising and falling with the tide. This broke a part of her stem and split some planks, which made her leak when she broke out the next summer. I went north with the boats with Mr. Chester just before the vessel broke out in July. We lay there during the winter, spring, and early summer. In July Mr. Chester and Captain Tyson made an expedition north with two boats. I went in the boat with Mr. Chester. Mr. Meyer was with us. Dr. Bessels was with Captain Tyson. We could not go farther north than Newman's Bay. Our boat was lost in the ice shortly after we started—when we were about three days away from the ship. We went back and got a canvas boat, and came again to Newman's Bay; but we got no farther north than about the middle of Newman's Bay. After staying there more than a month, trying to go north with the boats, they sent word for us to come back to the ship. We finally went back, and found the ship had broken out, and was leaking considerably. Afterward the leak seemed to diminish, and she made less water. We could keep her clear by pumping five to seven minutes each hour with the four deck-pumps; I don't remember what day, but some time in the month of August, we made our way slowly down along the west shore, until about opposite Cape Frazer, where we got beset in the ice. We floated down with the ice, getting southward whenever we got a chance. Finally we were anchored to a large floe, and floated down before it. At last, on the 15th of October, there came a severe gale, and another large piece of ice came up against the ship from the southward. The ship was under heavy pressure, and was lifted up and keeled over on her starboard side. We had a good deal of provisions, ammunition, and materials for fuel all ready on deck in case of an accident of this kind. The order was given to throw the provisions overboard on the ice. At the same time Captain Buddington sang out, "Work now for your lives,

boys." A party were out on the ice carrying provisions higher upon the ice. At the same time Captain Buddington saw that the ice-anchor had left its place, and should be put back. Some men went to do this. Just then the ice began to crack. We sang out to Captain Buddington that the ice was cracking just where the boats were. He gave orders to pull the boats on the solid ice. Just then the ice commenced to open again, and left some of our men on the separate piece of ice, with some provisions. Just as we got the old scow launched to take the men off this separate piece of ice, the ship broke loose and went away in the darkness. She was gone in an instant, and in a minute or two was out of sight. She drifted off. Finally, we launched one of the boats, and got the men off the separate piece on to the main floe again. The provisions that were on that piece were lost. It was a dark night, blowing a fresh gale, snow drifting very hard. We laid down and went to sleep on the ice, alongside the boats. We might have saved more provisions during the night, but Captain Tyson thought we would see the vessel in the morning. In the morning we could not see the vessel nor the provisions. We made several attempts to get on shore during that day but were not able to succeed. Along in the day we caught sight of the ship coming down from the northward, under steam and canvas. We set our colors; put an India-rubber blanket on an oar, dark side out. Supposed she was coming down to take us off. She didn't come, however, but steamed in between the island and main land; and we lost sight of her. We continued our efforts to get on shore, and got on various pieces of ice from time to time. One time Hans and Joe had gone out to see if we could get ashore; reported that we could reach it. They themselves had reached a small island, and came back and reported to us. We started, but before we could reach it the ice was again broken up, and we were adrift, and were unable to reach the shore. Finally, after moving about from piece to piece on the ice, we got back again on the main floe. We left one of our boats, however, on another piece, but about two weeks afterward we fortunately saw it again, and with some difficulty got it and its contents on to our main piece. After we commenced to float on the ice we rounded the channel between the island and main land, and we could see the ship lying close in shore. She seemed to us to be right up to the shore; her sails were furled, and there was no steam to be seen then. It was the shore of the main land that she was close to; that was the last we saw of her. We built snow-houses on the floe—on the highest parts of it. Four of the crew lived in one; Joe, Hannah, and Captain Tyson in another; Hans and his family in another; and another was used as a store-house. We were put on an allowance of eleven ounces of provisions per day. This was weighed out on a scale made by Mr. Meyer, with weights made with shot. We caught some seals during the winter, and lived on this floe, floating southward for five months. The floe, when we first got on it, was about one and a half miles across. We abandoned it on the 1st day of April. It was then a small piece, not more than twenty to twenty-five paces across. Our houses had been put on the thickest and strongest part of the piece. When we left this piece we took to the boat; we had left the others having been burned for fire-wood during the winter. Put in everything we could carry, and tried to make our way westward ashore. This we did for three weeks, making our way westward whenever we got a chance; and when the ice was not sufficiently open for us to do this, we landed on the solid ice. By this means we reached pack-ice drifted nearer shore. We caught a good many seals whenever we could

get to open water, but when we got to pack-ice we caught very few, and sometimes got very much reduced in provisions. About the 20th of April we were reduced to a handful of biscuits among nineteen people. On that very afternoon Joe shot a bear that came across the ice toward us, and from that time we had plenty of meat until we were rescued. We were finally picked up on the last day of April by the steamer Tigress, and brought into Newfoundland. We had a very hard time on the ice, and particularly after we started, trying to make shore. One night a heavy sea swept over the ice we were on, sweeping the ice-cakes over it. We could do nothing but cling to the boat, in which we had put the children and provisions, and hold it and ourselves on the ice during the whole night. We were all drenched to the skin that night, and never had an opportunity to dry our clothes until we were rescued. I think our separation from the ship was purely accidental. The next day she could have come back to us, but I don't know what condition she was in. I don't know whether she leaked any more just before she was taken away; perhaps they thought we could get to them; I don't know about that; perhaps they were not in a condition to do so. I hardly think the vessel can get out without assistance. I found a few pieces of drift-wood. I found a piece about half a foot long, soft wood, but could not make out what kind of wood it was. It did not come from anything that grew there, nor did it come from the boat. It was a piece of plain wood; had never been cut with tools. I found this as we were coming back from Newman's Bay to the Polaris, about thirty or forty yards southeast from the shore of Newman's Bay.

Question. Do you know of any difficulty between the officers on the ship?

Answer. No, sir; never heard of any difficulty, except some little difficulty between the captain and Mr. Meyer, at Disco. I have never seen any of the officers drunk. Did not hear of any officer being drunk. I did not keep any record. I cannot write.

Examination of William Jackson, cook.

I was born in New York; am 25 years old. I sailed with the ship Polaris; joined her in New London. I was ship's cook. I don't know anything about charts. After leaving Upernavik we kept sailing north. Kept in sight of land most of the way. Went up until stopped by the ice. Tried to make winter-quarters. We laid there some days, and then drifted farther south again, and went into winter-quarters below. We took some provisions ashore, and laid there, alongside an iceberg, all winter. After we got in winter-quarters Captain Hall went north, on a sledge-journey, and when he came back he was taken sick. I don't know exactly how long he was sick. I remember when he came back, but don't remember the date. I met him on the gangway, and shook hands with him. He was well and hearty. I saw him all the time after that. I slept in the cabin. He was taken sick directly after he came back from his journey; the same night. When he first came aboard, the steward got him some coffee from the galley. Cannot say whether he gave him anything else or not. The coffee was taken from the galley the same as everybody else had. It was directly after dinner, and he got the same coffee we had for dinner. I did not see the steward give it to him. That night he was sick. That night, when I came into the cabin, Captain Hall was sick. He accused people of poison-

ing him. He didn't call him by name, but I seen him point toward Dr. Bessels and say, "That man poisoned me." After he got pretty bad he thought everybody was trying to poison him. They said he was out of his head. He thought I was going to shoot him. I went to get my pipe one night out of my bunk. He sent Captain Buddington over to overhaul my bunk, to see what I had in there. I have no idea that he died any but a natural death. I have no reason to think anything to the contrary. There was no difficulty on board the ship; no mutiny or anything of the kind, so far as I know. After Captain Hall was buried on shore we lay in winter-quarters there all through the winter. In the spring an expedition was made north in the boats. I did not go with them. The scientific men were busy all the time. They had an observatory on shore and were kept busy. The doctor was making his observations, shooting birds, stuffing them, and such things, but didn't get many birds. The ship broke out before the boats came back. We tried to go up where the boats were, but could not for the ice. After they came back we started south. We kept going until we got beset in the ice; then we drifted down. On the 15th of October we were anchored fast to an ice-floe. The ice broke up, and the ship got beset in the ice. The ice came up from the southward and jammed her pretty tight. We thought she was sinking. We were putting provisions on the ice. While we were on the ice the ship got adrift. I don't know whether she slipped her lines or not. One of her lines slipped; the other went off I don't know how. It was blowing pretty heavy; I don't know what direction. We were on the floe we had been anchored to, on the main piece. Some of the other men were on the other pieces. Orders were for all hands to jump on the ice. I took my bag from the cabin, threw it on the ice, and then followed it. Other things from the ship were thrown to us. It was blowing a gale and snow drifting. Don't think it was snowing. Next day we tried to get ashore with our boats, but had to go back on the floe. In the evening we tried again to get on shore. We saw the ship before we tried to get on shore the last time. She looked to me to be about ten miles off. I could see her as far down as the rails. Could see her sail, but could not see the rigging to make it out. I was above the water, but not very high. When we left the ship she was leaking pretty badly; we had to keep her pumps going nearly all the time. We kept her clear with the hand-pump. When we saw the ship we tried to draw their attention. We got up a blanket on a pole or oar and tried to make them see it. Some of our party saw the ship afterward, but I did not. Four or five of us went over on the other side to get something. When we came back they said they had seen the ship. Then we floated down on the ice. We were on the ice six months and eleven days. I could not say how long we were on one piece. Most of the time we were on the piece the ship had been tied to. At first it was about two or three miles big; I should think, a round piece, but got down pretty small before we got off; I could not say exactly how large; I wanted to get away so bad I didn't take much notice how large the piece was. Whenever we got clear water we went in the boats; whenever we could not we went on the ice. Got feet wet sometimes. I stood the cold good deal better than some of the rest. Captain Tyson stood it the worst; he complained of cold nearly all the time. We got pretty near out of provisions. We caught good many seals while we were in the boats. Killed two bears, the last one not very long before we were picked up, just as we were getting out of provisions. We got down to our last

meal; had a little bread left, about enough for one man; we were going to have it for supper. About a week after that we were picked up. I cannot say that any officer on the ship got drunk. I never saw any one what you might call drunk. I heard them say some got drunk, but never saw them drunk myself; not at any time. There might have been such a thing, but I did not see it. When we first went on the ice, Captain Tyson was in charge of the provisions; there was something wrong about it, and he gave it up. Some others took charge. Whether he had some words with any of them I do not know.

Question. Were the provisions given to you to cook?

Answer. No, sir. We didn't do any cooking on the ice.

Question. Did you ever see any stealing of provisions?

Answer. No, sir.

Question. Did the man who had charge of the provisions give Captain Tyson his share?

Answer. The man who had charge had a small scales, which Mr. Meyer had rigged up, and gave each his share. He had this before Captain Tyson stopped issuing provisions. Captain Tyson directed the movements of the boats when we tried to get off; and directed the natives about the killing of seals, and things of that kind. Nobody, that I know of, refused to do as Captain Tyson told them.

Journal of Herman Siemans, sailor on board of the United States steamer Polaris, on an expedition to the north pole. C. F. Hall, commander. Translated from the German by E. R. Knorr, esq.

PRAYER WHEN STARTING.

ALL-KNOWING FATHER, on Thee I call and pray, that Thou mayest look upon us in Thy mercy and may be with us in this cruise to the icy North. Thou only knowest whether we ever on earth shall see again our beloved, or whether we shall soon lay down our pilgrim's staff. I pray Thee to direct the hearts of all of us, that all on this ship may always bow before Thee. Let our eyes always be directed toward the heights of Golgotha, where Thou hast borne the burden of our sins. Lead us to endeavor to gain that which only is needed, that we may all say together, we know that our Redeemer liveth. Then, even if the iceberg covers our mortal part, or the fierce polar bear tears it, we shall have Thee, Saviour, the best guide of our heart's ship. Hear my prayer in Thy great mercy, and for the Saviour Jesus Christ's sake. Amen.

Thursday, June 29, at 6 p. m., we left New York, and arrived on the following day, at 11½ a. m. at New London, where we dropped anchor. In the evening we had divine service on board, in which quite a number of members of the Baptist congregation participated. In the night there was a thunder-storm with rain.

Monday, July 3, we left New London, with fine weather. On the 4th, 5th, and 6th it was foggy, but otherwise fair. In the evening of the 7th, in the first watch, the weather changed; dark clouds rose S.W. above the horizon, and in a few minutes the entire sky became enshrouded; the S.W. wind brought rain-squalls, fog, and a violent thunder-storm; the lightning was without intermission; for moments it seemed as if the firmament was on fire. After midnight, however, the storm lulled down.

Sunday, the 9th, we had divine service from 11 to 12 a. m., and Cap-

tain Hall promised to have it, with God's aid, every Sunday. I was heartily glad that the name of our Heavenly Father should thus be hallowed.

Monday, the 10th, we saw the coast of Newfoundland.

Thursday, the 11th, in the forenoon, several heavy blocks of ice were passed. At noon of the same day we entered the harbor of Saint John's, in which there were two icebergs. We remained there eight days.

On Wednesday, the 19th, we left Saint John's, with God's aid all well and contented. In the evening, between 10 and 11, an aurora borealis illuminated the sky with splendid rays.

Tuesday, the 25th, the weather remaining fine, we were, at 5 p. m., in latitude 58° 44′ N.; longitude 52° 20′ W. There was again an aurora in the morning, showing beautifully at times in a semicircle, and then rising almost to the zenith.

Wednesday, the 26th, at 7 a. m., we passed a piece of timber which appeared as if it had been floating for several years.

Thursday, the 27th, at 3.30 a. m., we saw the west coast of Greenland and a great number of icebergs—some near the coast, others as far distant seaward as the eye could reach. At 3 p. m. a pilot boarded us in a kyak, a boat in which only one person can sit in the center and which only can be managed by one well used to it, as otherwise it would capsize directly. With these boats the natives go out to sea hundreds of miles, even in stormy weather. At 5.30 p. m. we came to in the harbor of Fiskanaes. Greenland, which I then saw for the first time, is truly a sterile, mountainous country. The Danish settlement, Fiskanaes, consists of twenty houses and huts, with about seventy people. The houses of the governor had a decent appearance, being of wood; but the huts of the Esquimaux were composed of pieces of sod, with so low an entrance that the people could only creep into them; a few were covered with seal-skin; the interior looked very poor. The natives live almost entirely on fish; they are quite intelligent, and there is more brotherly love between them than in many Christian communities. Their garments are made of seal and reindeer skin; their boots are generally lined with feathers. The women wear jackets and pants like those of the male, but they are distinguished by a black head-cover, through the top of which the hair hangs out in a plait interwoven with red ribbon; they also wear short boots, while those of the men are long.

Saturday, the 29th, at 3 a. m., we left Fiskanaes, with beautiful weather. At four hours we passed Lichtenfels, where two German missionaries live. In the afternoon the increasing breeze brought rain, and at 8 p. m. a gale blew from the S.W., creating a dark sky and a violent sea, which compelled us to stop the engine and to shorten sail, in order to avoid the icebergs. After midnight the gale abated.

Monday, July 31, we entered the harbor of Holsteinberg, where we counted sixteen huts and fifty people.

August 3, 2 p. m., we left Holsteinberg, and in the morning of the 4th we came in sight of Disco Island. We passed numerous icebergs, some of which we estimated of a height of 200 feet above the surface of the sea. At 2 p. m. a pilot came on board, and at 3 p. m. we anchored off Godhaven. This settlement contains twenty-seven houses, with about seventy people.

Sunday, the 6th, Captain Hall, with some of us, visited the church, where also thirty Esquimaux attended.

Thursday, the 10th, the United States ship Congress arrived from New York, with provisions and coal for us. We took as much as we could stow, and the remainder was stored on shore.

Tuesday, the 17th, we received some Esquimaux dogs, which are to draw the sleighs in our excursions. At noon Rev. Newman, of Washington, and Rev. Braine, of the Congress, came on board; the former preached a sermon and prayed with us. At 2 p. m. we left Godhaven with fair weather, and passed the same day many icebergs, which compelled us to change frequently the course.

Friday, the 18th, at 3 p. m., we were in latitude 71° 57′ N., longitude 56° 6′ W., and at 1.30 p. m. we entered the harbor of Upernavik. This settlement consists of twenty-two houses, inhabited by sixty people. The Esquimaux appeared more dirty the farther north we came; most of them looked as if they had been smoked. Here Hans came on board, with his wife and three children.

Tuesday, the 20th, toward evening, I ascended a hill, where I prayed some hours to God and my Redeemer, and thought of my distant dear. I also visited the burial-places, which lay scattered over the mountains, some almost near the tops, where it must have been difficult to carry the bodies. The coffins, of rough wood, were merely placed on the surface and covered with rock. The weight of the latter had burst the lids of some, so that the bodies could be seen. The Esquimaux told us that bodies which had been buried very many years appeared exactly as when buried. Formerly the law was, among the Esquimaux, that at the death of the parents the eldest son inherited the property. It is said that some of them have enticed their parents into the mountains, and then thrown stones upon them, under which they still lie buried.

Monday, the 21st, we received on board eight tons of coal, some more dogs, and seal-skins. At 7 p. m. the governor came on board, intending to accompany us to Tessuisak. At 8 we left Upernavik with fair weather, and arrived at 11 off Kingituk, where the captain and the governor landed to visit the governor of that place, returning at 1 o'clock with twelve dogs. We then proceeded, and came to on the 22d, at 5.40 a. m., in Tessuisak Harbor, where we also received a number of dogs, skins, and fur dresses. On the 23d fog prevented us from going to sea.

Thursday, the 24th, we left Tessuisak, the northernmost settlement. In the evening of the 25th we narrowly escaped running in the darkness, with full steam-power, against a large iceberg. In the night, from the 25th to the 26th, we were surrounded closely by drift-ice and icebergs, but with God's aid were able to work through them. August 26, 5 p. m., we passed Awash Island, in latitude 76½° N., longitude 70° W. At 7 p. m. we saw a piece of drift-ice protruding about two feet above the surface of the water, with thirty walrus on it. Seeing us they jumped into the water, and two shots fired into them seemed not to have hit them, the distance being too great. That night and the next forenoon we again were so surrounded by ice that it was difficult to proceed. At noon of the 27th we were in latitude 77° 51′ N., where the needle of the compass showed a deviation of nine points. At 3.30 p. m. we passed the harbor where Kane wintered in 1860; and at 9 p. m. the winter harbor of Kane in 1853 to 1855, where he left the remainder of his ship which he had not used for fuel, bore east distant 14 miles. No vessel but our Polaris has ever penetrated farther north on the west coast of Greenland. We did not meet there as much ice as we had expected. On the 28th of August, at 6 a. m., we came up with Cape Frazer in latitude 80° N. A boat was lowered, in which Captain Hall and five of us landed, for the first time in so high a latitude. We intended to look for a harbor, but did not find any place for shelter. Proceeding farther, we encountered great quantities of ice, through which we pushed on north. At 11 p. m. we passed Cape Constitution, on

Washington Land, (Greenland,) in latitude 81° N., the northernmost point reached by Dr. Kane, 1854, in sleighs, where he believed to have seen the open Polar Sea; but he erred, as we discovered the coasts to extend still farther in a northern direction, with high mountains back of them. On the 29th, at 11 a. m., we reached Cape Lieber, in latitude 81° 24′ N., discovered 1860 by Kane on a sleigh excursion. No one has ever been farther on the Grinnell Land side; here our discoveries were to begin. The distance of the coasts from each other, in the narrow part of the strait, is about 40 miles. The land is likewise mountainous and high. At 4 p. m. fog set in, and at 6 we were compelled to stop the engines, as we were surrounded by great ice-fields, to one of which we fastened the ship by ice-anchors and hawsers. At 7 p. m. the fog lifted, and we could see both coasts, when we again started, trying to press through the ice, with which the ship came frequently in collission. It was very cold, the wind blowing strong from the north. We worked along throughout the night to 6 o'clock in the morning, when we saw firm ice from one coast to the other. Under these circumstances it became important to look for a winter station, but there seemed to be none in this vicinity. At 9.30 fog set again in with snow, and we had again to fasten the ship to a floe, where we lay to 7½ p. m., when we saw some clear water near the Greenland coast, for which we directed our course. Believing to see a small bay, a boat was lowered and the place examined, but it proved too exposed for the ship. We worked along the coast until midnight, when fog compelled us to fasten the ship.

August 31, at 6 a. m., the fog lifted. We started and continued the search for the entire day, but in vain. At 4 p. m. we directed the course for the Grinnell Land coast, but the ice prevented us from reaching it. At 6 p. m. we made fast to a great floe.

Friday, September 1, we saw in the morning a small opening, through which we worked the vessel about the distance of a mile nearer to the coast, where we had again to make fast, as we could then not move the ship in any direction. Toward 7 p. m. a strong easterly wind arose, setting the stream with the ice against us, the smaller pieces of the latter drifting faster than the floe to which the ship was tied. This pressure broke the hawsers at the bow and the stern, and lifted one side of the ship almost bodily on the floe to which we lay, imperilling her greatly. As the ice, pressing from all sides around us, had a thickness of at least twenty feet, it became imperative to provide for emergencies. Provisions and stores were carried on deck, and guns, cartridges, two suits for each person, &c., placed within easy reach, so as to land them on the ice in case the ship should be crushed. Toward 9 p. m. the wind abated, the ice ceased to press, and remained quiet throughout the night. The following day, in the morning, we unshipped the propelier, in order to save it from being broken. At 2 p. m. the pressure of the ice began again, huge masses approaching the ship. All hands were now employed landing provisions and fuel on the ice, in two places, so that one part might be saved in case the ice should break near the other. When a considerable quantity had been landed, more was carried on deck as a reserve. In the night following that day the ice kept more quiet, although there was a snow-storm.

Sunday, the 3d, divine service was attended to from 11 to 12, as usual. The snow fell so thickly as to allow us only occasionally to see the coast of Greenland, although it was distant only two miles. The highest place we had reached was, according to astronomical observations, between latitude 82° 20′ and 82° 30′ N., but now we drifted quite

briskly south. Ship and crew appeared to be a ready prey to the ice. But there is a God who aids and saves from death; to Him I trusted between these icebergs and ice-fields, although I know that I do not deserve all the good he grants me.

September 4, at 9 a. m., open water appeared at a few places, when everything was quickly shipped again. There was some difficulty in replacing the screw in its position, as the latter was frozen over. At 9.30 p. m. steam was ready and we began to work toward the coast of Greenland, where the wind had broken the ice and caused an opening. At 11 p. m. we had succeeded in reaching this, and a boat was lowered for the examination of a bight. At midnight Captain Hall landed with five of us, and planted, in the name of the Lord, and for the President of the United States, the American flag on the land which we had discovered. We then returned on board, and let go the anchor at 12.30 a. m. of the 5th of September. The place examined proved to be but a bend of the coast; we therefore took advantage of the open water caused by the easterly wind along the coast, and resumed our search for a harbor southward, but not finding any better place we returned in the evening to the anchorage, and began immediately to land provisions. Snow continued to fall as thickly as the entire day and the preceding night.

Wednesday, the 6th, the weather was pleasant, the sun shining as bright as we had not seen him for some time. Astronomical observations proved the ship to lie now in latitude 81° 38′ N., longitude 61° 45′ W.; we therefore had drifted south 47 miles. Toward evening the weather changed to a violent snow-storm from the S.W.

Thursday, the 7th, at 5 a. m., we lifted the anchor, and steamed about sixty yards closer in-shore, behind an iceberg which had grounded in 13 fathoms water, and promised to protect us against southerly and, in a part, also westerly winds; it was 450 feet long, 300 feet broad, and 60 feet in height above the water. Our main occupation now was transporting provisions and stores to the shore.

Sunday, the 10th, we could not use boats any longer, and in a few hours the ice grew thick enough to carry us with the food for the dogs, that had been housed on shore. After divine service, Captain Hall told us that he would call the place Thank God Harbor, as the Lord had not only carried us through the dangers of the ice, but also protected us against the imminent peril of an explosion of the small boilers, which had not been fed with water, through the neglect of the fireman.

Monday, the 11th, the ice had grown so firm that we could employ the sleighs.

Tuesday, the 12th, it was cold, and snow fell, the wind blowing strong. Until then the twilight had remained on the southern horizon throughout the nights, but these now grew longer, and soon we would have, in the midst of the Greenland mountains, the long winter night. But why should we fear the darkness around us, if light remains only in our hearts? Yes, my Lord, if I have only Thee, I do not care for heaven or earth.

In the morning of the 13th the ice broke again at a distance from us. The two Esquimaux, Joe and Hans, went on a hunting excursion, and brought, late in the evening, three hares; the latter have thick, soft, and snowy-white hair, with a black spot behind the ears. A few days previously they had shot a seal, a hare, and four geese.

Thursday, the 14th, the weather was beautiful, but toward night a southerly gale set in, which broke, half an hour after midnight, all the ice in the vicinity, packing it in several places.

Friday, the 15th, the weather was rough, and it snowed throughout the day.

Saturday, the 16th, at 9.30 a. m., Mr. Meyer, Mr. Bryan, and Mr. Mauch went to a mountain fifteen miles S.E. of us, intending to begin a survey from there; they returned at 1.30 p. m., almost frozen, as they broke through the ice when passing over it. During the night it froze briskly, the cold southerly wind whistling through the rigging.

Sunday, the 17th, after divine service, Captain Hall enjoined us to work hand in hand, like brethren, in order to reach our aim for which we had started. He said that he firmly believed it to be God's will that all of the wonderful earth not yet known should be discovered.

Monday, September 18, Dr. Bessels, with the first mate, Joe, and Hans, started on a sleigh, drawn by eight dogs, on a hunting excursion.

Tuesday, Wednesday, and Thursday the weather remained fine, but on Friday, the 22d, it blew a gale from the south, at times so stiff that we had to secure better the observatory, a wooden building which we had brought in pieces from New York.

On the 23d the sun showed a large halo. At divine service, on Sunday, the 24th, the sermon and prayer were read by Mr. Braine; they had been prepared by Rev. Dr. Newman expressly for the expedition. At 2 p. m. the hunting party of Dr. Bessels returned with a musk-ox, which they had killed the second day out; the meat, skin, and head, which they brought home, weighed 309 pounds. The ox, after being hit first, was kept at a stand by the dogs trained for it, until the animal was brought down by four more balls; one of the dogs, however, was twice thrown high into the air.

Wednesday, the 27th, the barometer fell suddenly, and at 11 a. m. a violent snow-storm commenced, continuing the entire day and the following night. At 4 p. m. the ice broke up and packed. On the 28th it again came in commotion, and pushed so heavily against the vessel that this would certainly have been crushed if she had not been so strong, and the Lord had not protected us.

Friday, the 29th, a gale from the N.W. sprung up, which abated somewhat toward 5 a. m. of the next morning, but blew still quite fresh the entire day.

In the morning of October 1 (Sunday) the gale ceased, and the weather remained beautiful throughout the day. After divine service, Captain Hall informed us were, from that day, to assemble each morning at 8.30 in his cabin for prayer. How good is it to serve under a commander in whose heart the Saviour has begun the work! We should always bear in mind that each day and each hour carries us nearer to the end of our pilgrimage, where we have to lay down our staff. I pray the Lord to open my eyes that I may look to Him with spirited confidence.

Tuesday, the 3d, we began to remove the provisions to a hill, as on the flat ground where they had been placed they were too readily covered by snow.

Thursday, the 5th, Joe and Hans shot two seal, but got only one, the other being carried away by the ice, which was a mile ahead of us in the strait, still drifting.

Friday, the 6th, at 7 a. m., six of us went out sealing, taking a boat along, but we saw the entire day only one seal and one white fox, which both escaped. In the following night a gale blew from the east, and it was severely cold.

Sunday, the 8th, the weather was fine. There was divine service from 11 to 12. The Lord wills it, but it is hard, for one who wishes to

follow Christ to live among worldly people, and to hear the name of the holy God taken in vain. We should always remember that we shall have to account for every word we speak.

Monday, the 9th. After much labor we now had carried all our things safely on the hill. About noon of this day, Captain Hall, accompanied by Mr. Chester, Joe, and Hans, started, on two sleighs drawn by sixteen dogs, on an expedition for the purpose of reconnoitering in the direction toward the pole. It was his intention to go about hundred miles, if possible, in order to ascertain whether it would not be preferable to attempt reaching the pole by the land; it was also hoped that musk-oxen would be found for furnishing the fresh meat, which in this latitude is so very essential for health.

Friday, the 13th, it blew fresh from the east. One boat had already been transported to the shore; we now carried there a second, also coal, wood, and other things, so that a stock would be on shore in case an accident should happen to the vessel. Up to then all hands were in good health, for which I daily thanked the Lord. God, I pray Thee, let me always be obedient to the teachings of Thy holy word with ever greater cheerfulness. May never donbt or mockery destroy the consolation alive in my breast. Let my whole life be a praise of Thee. The water we used we obtained from ice, which we brought from the hills or cut off from the big clumps. Although the latter was frozen salt-water, the melted water was perfectly fresh, as the salt works out in course of time. The great glaciers consist entirely of fresh water; they are created by the snow which settles in the valleys and ravines; in the summer this snow melts in the day, but at night the water freezes, and thus ice agglomerates to a great amount, moving along each day from seven to eight feet. Generally they have a strong foot, which always protrudes ahead. When meeting heights in its route, it first fills the lower parts and then proceeds onward over the elevation, carrying away generally a considerable piece of it. Small elevations it levels directly. The place of its origin, its route, and the place of its discharge in the water are marked by the moraine which it throws off to both sides. Rocks or *debris* which fall down upon it from the mountains, it throws off to the right; but whenever two glaciers meet on their route obliquely, the *debris* is thrown between them. The earth is everywhere the Lord's; there is evidence even in the highest north that an almighty and all-wise Creator has made it.

Saturday, the 11th, a violent snow-storm from the north set in, blowing to the evening of Sunday.

October 13, we saw the sun for the last time in 1871; we would have seen him to the 17th if the mountains of Greenland had not shut out the true horizon.

Wednesday, the 18th, we began building a snow-wall around the ship.

On the 19th it was bitterly cold, and on the succeeding night a gale blew from the south, veering, on the 20th, around to east, and blowing then so violently that we could not work outside of the ship.

On the 21st we spread over the ship a snow-tent of stout sail-cloth, leaving only a small opening for ingress. Daylight shortened rapidly.

Monday, the 23d, snow fell throughout the day, and from 3 p. m. a hurricane blew, abating, however, at 8 p. m.

Tuesday, the 24th, at 1.30 p. m., Captain Hall returned with Mr. Chester, Joe, and Hans. Captain Hall had not felt well for the last three days, and laid down to bed immediately. He vomited, had cramps, and a violent headache. They had encountered on the expedi-

tion severe cold, and suffered greatly. They had not been able to go farther than fifty miles from the ship in a N.E. direction. Animals they had not seen, only tracks of the musk-ox. Captain Hall had formed the opinion that it would be easier for an excursion to push north on the Grinnell Land side, as Greenland trended too far east. Toward the evening a violent snow-storm from the north commenced, increasing to a hurricane of such violence that the ship moved, although inclosed by heavy ice and embedded in snow. On the 26th it had already grown so dark that we could see the stars throughout the day.

Saturday, the 28th, it grew dangerous with the captain, his illness increasing steadily. He suffered from a concussion of the brain, [*Gehirn-schlag*—brain-apoplexy, verbally translated,] and his mind wandered almost constantly. Prayers and divine service were held forward for his recovery. I asked, in the morning, Mr. Braine (Bryan?) about the state of his soul; he answered that he had said that he was not prepared to die. The prayers which I sent incessantly to the throne of the Almighty did not satisfy me; I, poor sinner, was anxious to kneel with him before God, and to pray for mercy. In the forenoon I asked Captain Bord (Buddington?) whether I would not be permitted to see Captain Hall; I was anxious to watch over him, as he frequently recovered his senses, but to my great sorrow I was refused. I was very dissatisfied, the more as Captain Buddington was also a brother in Christ. But there were some who did not at all believe in Jesus Christ nor in the Bible, although our Saviour has sacrificed his dear life for us all and taken upon himself the burden of our sins. But I believe that the Saviour has worked in Captain Hall before he was struck down by this sickness.

October 30, we had a snow-storm from the north.

On November 1 the captain appeared to grow better, as he spoke as sensibly as any of us.

Thursday, the 2d, the weather was beautiful and calm, although severely cold. The snow-wall around the ship was seven to eight feet thick, and of the same height as the snow-tent. The snow was carried to the ship in sleighs from banks, which formed sometimes near the ship, sometimes at a distance from it.

Up to the 3d of November ten dogs had died, six large and seven small, two of them on the last excursion. There were fifty-four altogether—six of the Newfoundland and forty-eight of the Esquimaux breed. They then were fed only twice a week. My heart would almost break when I saw the poor creatures thus starved. He who caused this will have to answer for it at the last day. He who delights in the sufferings of a beast will grow cold and heartless, and surely also torment his fellow-men; he never can love God.

November 5, Captain Hall grew again worse; in the wanderings of his mind he said that somebody intended to shoot or poison him. That day Hans and Joe harpooned a seal which they had shot at the day before, but had not caught; its oil was estimated at 40 gallons.

On the 6th the weather was mild; snow fell in the evening, ceasing in the morning of the 7th. That night Captain Hall had another attack of apoplexy, and at 2 it seemed as if he would part life. He lost his senses; his face and his tongue were paralyzed; and his hearing had suffered. The next day he lay in a very miserable state, the entire body being insensible to the touch. In the evening he was entirely unconscious of what occurred around him or was done with him. At 3.25 in the morning of November 8, 1871, his soul left the mortal body. I remember well the day when he attended, with his sister, divine service on

board at New London. After service he made a speech, saying he believed firmly that he was born to discover the north pole. After he should have set his right foot on the pole, he was willing to die. But the Lord had decreed otherwise, and before that aim was reached he called out to him, "Man, prepare thy house, because you shall die." O, would this lead us to the Lord, as perhaps soon also our last hour may approach. After his death, a coffin was immediately made, into which he was placed at 4 p. m. We also began to dig a grave, working at it Wednesday and Thursday. The earth was mixed with rock, and frozen so hard that, although using axes and poles, we could dig only two feet deep. It was done with the light of a lantern.

Friday, the 10th, at 11.30 a. m., we placed the corpse into the ground. Captain Hall had reached, as I was told, the age of 50 years. His body rests in the far north, where no civilized human being has ever laid down his head for eternal rest, as the place lies in latitude 81° 38′ N., 502 miles from the north pole. Thus his wish to die in the far north, and to rest where he had lived eight years, has been fulfilled. May his remains lie in peace till the day of resurrection.

That day, and Saturday, the 11th, we had a violent snow-storm, which abated at noon of Sunday. The velocity of the storm at its height was 47 miles per hour. This was the first Sunday that Captain Hall was no more. I felt the loss severely, but he was now better off than we. The rough gales of the cold north and east which blow here will be nothing to him. What is human life but a strife from the cradle to the grave? Blessed is only he who lives with the firm hope that he may find beyond the grave a better life.

Continued observations were now made on the shore, by Dr. Bessels and Mr. Meyer, of the temperature, the wind, the deviation of the compass, &c. On board, tidal observations were made every hour, and, at times, every ten minutes.

Wednesday, the 15th, at 5 p. m., we saw, for the first time in our winter-quarters, an aurora borealis to the south of us.

Thursday, the 16th, a violent snow-storm blew till midnight, accompanied by severe cold.

On the 17th the strait between Hall's Land (named now by us so) and Grinnell Land had not yet closed entirely. It closed occasionally after a calm of some days, but opened again for miles with each strong breeze creating a stronger current. The weather was very unsettled; a dead calm would be interrupted suddenly by a violent gale; the same was the case with the temperature; one day the thermometer stood at zero, the next 20° below.

Saturday, the 18th, at 7 p. m., a gale sprang up from the north, growing very severe from midnight to two hours past, so as to attain a velocity of 47 miles per hour.

Sunday, the 19th, after divine service, Captain Bord (Buddington?) announced that the morning prayers would be discontinued, as Mr. Bryne was otherwise engaged; each should pray by himself. Would God's love open the eyes of all kneeling down together! Pray and work. I, poor benighted sinner, must confess that I have to contend many an hour with enemies within myself and outside, but hope does not leave me. When kneeling far north in a dark corner, or beneath the starry heaven on a floe, I look with confidence to the mountains from which I expect aid. Although not being able to show a single deed by which I may stand before the just Judge, I trust to the Lord's mercy.

Monday, the 20th, at 4 in the morning, intending to examine the tide-

gauge, I was carried away by the storm and thrown upon the ice, which was covered with water; only with great difficuly could I reach the opening where the observations were made. The snow-drift did hardly permit opening the eyes. It blew so violently that the ship was thrown upon one side, bursting the snow-wall. At 9 a. m. Mr. Meyer left the vessel to look for Dr. Bessels, who had been all night in the observatory on shore; he was driven back about twenty times while endeavoring to creep up the hill, but finally reached the house. Joe and Hans followed, and at 10.30 all four succeeded in reaching the ship. Dr. Bessels had been without fire since 1 o'clock, for want of coal. He had a frozen ear, Mr. Meyer a frozen eye-lid and hands, and Joe the right cheek. At 3 p. m. the gale lulled down, but broke out with renewed fury at 9.30, attaining a force of fifty to sixty miles per hour, and veering constantly between east and north. The thermometer stood at 24° below zero. At 1.15 past midnight the ice cracked around the ship, and at 2 the snow-wall had sunk to two feet.

Tuesday, November 21, at 8 a. m., the ice broke all around us, and we were in great peril; the snow-drift, besides, made it so dark that we could not see anything at a distance of five paces. We let go the second anchor; nevertheless, the ship drifted, but luckily toward the iceberg near which we lay, and which had been named, by Captain Hall, Providence Mount. Some of us jumped over the few floes between us and the iceberg, climbed upon it, and succeeded by 1 p. m. to fasten three ice-anchors, to which the ship was secured by hawsers. In the afternoon the fury of the gale began to abate; we were able to see a greater distance, and found that the water was open all around us.

Wednesday, November 22, the weather was again fair, although severely cold, the wind being from the east. We now saw that to the southward of us, between the iceberg and the shore, there was still a strip of ice lying, by which we could reach the coast. Three of our sleighs were lost, two of which had already been used by Dr. Kane, but luckily all the dogs were safe; they had been taken on board when the gale set in, with the exception of two, which were found in their kennel on shore.

Friday, the 24th, the weather was fair and the temperature —23°. The observations, which had been interrupted by the gale, were resumed. In the evening we saw electric clouds, which we had observed already occasionally; they were white, combining sometimes, rainbow-like, into a circle between the zenith and the horizon.

Saturday, the 25th, in order to bring the ship, which thus far lay at the extreme of the iceberg, more toward the center of its long side, where it would be better protected, an opening was sawed into the ice, through which she was moved one hundred and twenty feet.

Sunday, the 26th, divine service was held, but Captain Bord (Buddington ?) announced that attention was not compulsory, but he would prefer that all should attend.

Monday, the 29th, fair weather; temperature —27°.

Tuesday, the 28th, it was mild; temperature —6°, but the barometer fell slowly. At 8 p. m. a snow-storm set in from S.S.W., which soon grew violent, and at 1 o'clock had attained a force of forty-two miles per hour, pressing the ice from the strait against our iceberg, which burst and parted in two; thus weakened, it was pushed against the ship, shaking her all over and making her crack in all seams. With ebb-tide the ship keeled over on one side, while the foot of the iceberg pushed beneath her, so as to raise her two and a half feet. She careened so heavily that it was difficult to walk on deck. In this perilous condi-

tion it was thought proper to carry apparel and other stores on shore, as also to place the Esquimaux women and children into the observatory. Toward morning of the 29th the storm went gradually down and the ice became quiet. The power of heavy ice propelled by wind and current is immense; had the ice inside of the iceberg been equally as strong as that pushing onward from the strait, so that it could not have given way, the ship would surely have been cut through or thrown over.

Thursday, the 30th of November, the weather was fair. Thanksgivings-day was observed, but no divine service celebrated.

Saturday, December 2, mild, beautiful weather, wind variable. At 10 p. m. it blew strong from the north, but only to midnight. That evening we saw three moons besides the true, the four forming a beautiful cross. The same appeared again Sunday night. The ice in the strait, which was still open, made considerable noise. The rise and fall of tide at full and change is six to seven feet; during the first and last quarters of the moon, one to three feet, depending, however, upon the wind.

December 5, the weather remained fair and mild until noon, but in the afternoon a gale arose from the south, increasing in the evening. At midnight snow began to fall, when the wind gradually calmed down. Dr. Bessels left the ship for the observatory at 2 o'clock past midnight, and, although it was only a distance of a quarter-mile, did not reach it before 6 in the morning. On account of the difficulty of reaching it in dark weather, a wire was stretched next day from the ship to it.

Sunday, the 10th, the weather was beautiful and mild. In the evening, as on the evening before, the aurora was seen in different forms. At one time it showed in the form of an arc, spanning the mountains from S.E. to N.W., at an elevation of about 20°. We also saw numerous shooting-stars, sometimes forming, as it were, a silver thread from the point where they first appeared to that of disappearance; in a few instances I have seen small fire-balls pushing out from them, similar to those of a rocket.

Monday, the 11th, at noon, a strong breeze sprang up from the north, veering east toward evening.

Wednesday, the 13th, beautiful weather; temperature, —13°. There has, perhaps, never been an expedition the members of which did live so peacefully as we. The Navy Department had directed that, in case of Captain Hall's death, Captain Buddington should take command of the ship and Dr. Bessels direct the scientific matters and the sleigh expeditions. Should the two disagree, Captain Buddington had to carry the vessel home as directly as possible. As long as Captain Budding held the command, he treated everybody properly; the first officer is also an honorable man, who knows how to handle people. O, would we thus keep in harmony! at least, in a worldly way, if not spiritually, as long as we are together, with God's aid. How beautiful is it when brethren are true to each other and live in peace!

Thursday, the 14th, beautiful weather; in the evening a fresh breeze from the N.E., lasting to Friday evening, with snow-drift during the night.

Saturday, the 16th, a storm set in from the east, veering north in the morning, when it increased and caused a snow-drift, lasting to Sunday night. In the evening there was a wonderful display of the aurora, showing innumerable rays, some of which extended from the southward through the zenith to the northern horizon; the northern rays suddenly disappeared and the southerly passed in a great arc from the S.E. to

the S.W., where they also disappeared; they constantly changed, sometimes shooting from the horizon to the zenith.

Monday, the 18th, light breeze from S.E.; temperature, —28°. In the evening the wind wore south, breaking out in squalls.

Tuesday, the 19th, at 7 a. m., a gale sprang up from the S.W., lasting to 6 a. m. of the 20th. On the 21st, and up to noon of the 22d, the weather was beautiful, but then it began to blow from N.N.W., continuing to the morning of the 23d. At 10 a. m. of that day it again began to blow from the east, continuing in puffs and with snow-drift throughout the day. Toward 6 p. m. it became calm.

Sunday, the 24th, beautiful weather, with a southerly breeze. In the evening (Christmas eve) all hands were invited into the cabin, but I did not feel home there, Captain Hall not being any more in our midst.

On Christmas-day, the 25th, the weather was fine, the temperature 33° below zero. I was astonished that there was no divine service, but, I believe, in America it is more of a feast-day than a holy-day.

Thursday, the 28th, the temperature was, after midnight, —35°, and in the morning —30°. The ship still careened somewhat with the rise and fall of tide, as part of the keel was still resting on the foot of the iceberg. We tried to break the latter by blasting, but did not succeed, the ice being too strong.

Friday and Saturday the weather was fair.

Sunday, the 31st of December, 1871, was the seventy-ninth day we had not seen the sun, but the middle of the long night was now passed, and the sun was approaching again, having reached, on the 22d, the greatest declination, (23° 27′ 21.″3.) A small arc of the horizon of about 1° 30′ was even that day still somewhat illuminated, and we never had the total darkness, even in latitude 81° 38′, which Kane reported in 78° 38′ N.

Monday, the 1st of January, 1872, I thanked the Heavenly Father, who stood by us last year through so many perils, and granted us to live into the new year, except the dear captain, C. F. Hall, who now rests in the cold earth of Greenland. But many, besides him, who enjoyed the best health last New-Year's Day, have gone, like him, to their graves. Our life is like the blossom of the grass. Our years and hours pass quickly, and not a moment returns; it cannot be brought back.

On the 2d of January we again attempted to blast the ice under the ship. After cutting a ditch along the vessel at a distance of fifteen feet, four flasks of powder were ignited under the ice, but it was in vain; a greater quantity of powder, ignited so near the vessel, might have injured it.

Wednesday, the 3d, beautiful weather, but overcast in the evening. Three hours past midnight the wind veered from N. through E. to S.E., and back again, in violent puffs.

On the 4th, toward 7 a. m, a stiff breeze began to blow from N.E., continuing to 8 p. m.

From noon of Saturday, 6th, to Sunday forenoon, the sky was illuminated, almost without interruption, by aurora borealis, at times in a wonderfully splendid display of bands following each other over an arc of 120°.

Tuesday, the 9th, in the morning, the thermometer showed 48° below zero, the sky being clear and the stars bright. The weather remained fair and cold throughout the day, but at one o'clock after midnight a storm set in from the north with snow-drifts.

On the 10th, at five in the morning, I saw a bright arc in the sky, running from the western horizon through the zenith to the east, parallel

with the Milky Way, at the distance of about 12° from it, which disappeared about 6 a. m., leaving, however, three clouds of the same brightness near the zenith. Some said that this phenomenon was electric, but I did not believe it, as I distinctly saw narrow bright strips running from the south into it, which caused the bright color. I considered it to be an aurora. During the gale the wind frequently sprung around; it continued so to 3 a. m. of the 11th. At 9. p. m. of that day it again began to blow from the north, with a snow-drift, abating Friday, the 12th, at 11 p. m.

Throughout Saturday, the 13th, the weather was beautiful, but at 10 p. m. it changed to a gale from the north, with a force of thirty-nine miles per hour, which continued to Sunday morning, 7 a. m.

Wednesday, the 17th, twilight appeared to the S.E. as early as 8 a. m. The strait was not yet bridged by ice.

Until Saturday the weather remained fine. In the forenoon of that day a fresh breeze set in from the W., veering toward evening to S.W., and continuing so in puffs. Throughout the night and Sunday the weather was mild, with snow.

Monday, the 22d, wind S.E., with overcast sky. At 2 p. m. it began to snow, and a fresh breeze blew from 5 p. m. to 2 a. m.

Tuesday, the 23d, mild.

Wednesday, the 24th, calm. At 10.45 a. m. Dr. Bessels, with two of the crew, left the vessel in a sleigh drawn by eight dogs, to ascertain how far the open water extended north; they could only proceed nine miles north of the vessel, where the water was still perfectly open; their further progress was stopped by a cape, which they could not pass nor climb, as it was too steep and too much covered by ice. The ice in the strait was drifting up and down with the current. At 5 p. m. they returned on board.

Thursday, the 25th, thermometer. —24°. At 10 a. m. Mr. Chester and four men, in a sleigh, with twelve dogs, left the ship to attempt pushing farther north than Mr. Bessels had been able, but did not succeed in crossing the mountains, as they everywhere were covered by ice, and it was too dark to find a pass; he returned at 4 p. m.

Friday, Saturday, and Sunday the weather was quiet and fine; temperature 20°, 30°, and 35° below zero. Monday and Tuesday, mild. Wind S.

Wednesday, January 31, at 3 a. m., a snow-storm from the N.E. set in, with a force of 40 miles, increasing on February 1 to a hurricane of 53.6 miles per hour in force. We had to discontinue the tidal observations, as we could not keep the opening in the ice free from snow. They could not be resumed before Friday.

Saturday, the 3d, beautiful weather, with a clear sky. Temperature, —28°. Some of us attempted to make an excursion north, but could not go far. It was wonderful to see the great icebergs and masses of ice, appearing like a fortress, thrown over each other on the coast by the force of the hurricane, to the height of houses, freeing the strait perfectly, which now showed only young ice made since.

Sunday, the 4th, fair weather. Temperature, —30°. In the forenoon there was divine service, but it was sad to see that so few took interest in the word of the Lord; not many did attend.

From 7 p. m. to 7 a. m. of Monday, there was a display of the aurora, more beautiful than ever. The entire sky was illuminated from the horizon to the zenith, where the rays met; some were faint, of a bluish-white color, others reddish, and at times the northern sky all over deep red. Sometimes the rays combined to a screen, passing the zenith and

disappearing north, but they were soon replaced by others. It was as if a regiment of troops retreated before an enemy closing in on them. There was a light breeze from the E., the temperature being —26°. Daylight had increased so much that we could now read the tide-gauge without lantern-light for some hours.

From Monday to Thursday the weather was fine, the wind variable. Temperature, —20° to —32°.

Thursday evening a fresh breeze sprang up from S.E., continuing to Friday afternoon. On that day Hans went hunting seal, but did not get any; he saw but one, and heard another one gnawing the ice, which they do in order to make holes for breathing. These holes they make generally large enough for their head, but frequently they are so small that they can only poke in their nose. The seals have an exceedingly fine scent, enabling them to ascertain the presence of men immediately. They are, however, very inquisitive, and appear to be fond of music, as they generally approach cautiously when they hear whistling.

Saturday, the 10th, mild weather. Temperature, —13°. Light southerly breeze with fog.

Sunday, February 11, at 8 a. m., it began to blow from N.E., increasing to a force of 40 and even 48 miles per hour. In the evening there was again an aurora, which now was so frequent that I may not have recorded all. Two hours after midnight the gale abated, and the following day, 12th, was fine, with a temperature of —20°. In the evening a fresh breeze from the S.W. set in, continuing to noon of the 13th, when the sky, which had been overcast, became clear.

From Monday till Saturday the weather remained fair, generally with a light southerly breeze and a temperature of —30° to —45°.

Saturday, the 17th, the barometer fell suddenly, the sky covered with clouds, and at 11 p. m. there were violent squalls, alternately from S.E. and N.W., until, at 1.45, a gale blew from the S.W., with snow-drift. At noon of Sunday it had increased to a hurricane, 58 miles per hour in force. This terrible weather continued to Monday, the 19th, 5 a. m., when snow began to fall and the wind became variable, but at 8 a. m. it grew again to a hurricane from the opposite direction, attaining a force of 57 miles per hour. In the morning of the 20th, when snow began to fall, it abated somewhat, and calmed down at 3 p. m. These gales generally terminate with squalls, decreasing by degrees in violence. In the evening the sky became clear. At midnight I saw four moons besides the true. The latter was encircled by a halo in which two of the false moons stood, while the two others were in a second halo, concentric with the first, the false moons standing respectively N.W. and S.W., N. and S., of the true. The two nearest to the true moon had the colors of a rainbow, the others were faint. It was a beautiful phenomenon.

Wednesday, the 21st of February, daylight had increased so much that we could not see any longer the stars at mid-day; we had seen them in a clear sky at all times for one hundred and seventeen days. Throughout that day the weather was beautiful, the temperature 37° below zero. At 10 p. m. a stiff breeze from the north sprang up, veering, at two o'clock, N.E., increasing then to a gale, with snow-drift.

Thursday, the 22d, it wore back, northerly, and attained a force of forty miles per hour; at 9 p. m. it decreased. Temperature, —39°. During the night it blew in puffs from the N.E.

Friday, the 23d, in the morning, the temperature was as low as —47°, and throughout the day not less than —30°, with a variable wind. There was much open water in the strait, especially N.

Saturday, the 24th, the weather was fair, with a light breeze from the south. Temperature, —35°. In the forenoon some of the crew went four miles north of the ship hunting seal, but where had been seen water the day before there was now ice.

Sunday, the 25th, light southerly breeze. There was no divine service, which had been neglected also the previous Sunday.

Monday, the 26th, it ceased snowing. At 2 p. m. a strong breeze from the east set in with snow-drift, and a temperature of —27°. The wind ceased at 11 p. m.

Tuesday, the 27th, overcast sky. Temperature, —22°. In the afternoon it began to blow from S.E., with a snow-drift, ceasing after midnight.

Wednesday, the 28th, fair weather, with a clear sky and a light breeze from the E. Temperature, —22°. At noon we saw the sun for the first time in 1872, after one hundred and thirty-eight days of darkness. Would the horizon not have been covered by the mountains, and the sky been clear, we should have seen the upper limb already on the 25th of February. It was truly a long, dreary night which we had passed, by the Lord's aid, in the midst of icebergs and ice-fields. That day I visited Captain Hall's grave, as I had frequently done. How would he have enjoyed it to see again God's sun. But we all must pay to nature the last tribute, and lay down our head to rest.

Thursday, the 29th of February, there was again a tremendous gale from the E., veering, in the afternoon, to N.E., with snow-drift. In the evening it attained a force of fifty miles per hour. Temperature, —30°. Toward 2 in the morning the gale began to decrease, and from 8 a. m. of the 1st of March there was but a breeze from the N.E., continuing throughout the day. The thermometer stood for eight hours at 37° below zero.

Saturday, the 2d, stiff breeze from the N.E., with snow-drift, and a temperature of 43° below zero.

Sunday, the 3d, beautiful calm weather. Temperature, —46°. We saw the sun as early as ten o'clock in the forenoon.

Monday, the 4th, fresh breeze from S.W. Temperature, —40°.

From Monday to Saturday the weather was changeable, with light and strong breezes, the temperature not below —20°, mostly above —46°, and on Saturday —48°.

Sunday, March 10, a gale blew from N.E., with snow-drift. Temperature, —35°.

Monday, the 11th, strong breeze from E.S.E. until evening, when it wore to N.E. Throughout the night, and Tuesday, the 12th, until 6 p. m., a hurricane blew from the N.E., fifty-five miles per hour in force.

Wednesday, the 13th, the weather was delightful. In the morning we saw, for three hours, three false suns surrounding the true, and then a halo around the true. Two of the false suns had the colors of a rainbow, caused by small snow crystals which fell from the sky.

Thursday, the 14th, beautiful weather. Temperature, —32°. Hunting excursions were now made every day, but thus far no seal was shot nor any other wild animal seen. Animal life had not yet made its appearance. In the fall, when the sun leaves the northern part of Greenland, the wild beasts go south, returning in spring after the reappearance of the sun.

Friday, Saturday, Sunday, and Monday the weather was splendid; the temperature between —15° and —30°.

Friday, the 15th, the tops of the mountains were lighted by the sun

as early as 7 a. m.—a splendid sight. It grew hardly any longer dark, as there was now twilight at midnight.

Tuesday, March 19th, beautiful weather. That day the snow-tent was removed from the ship, so that we did not need any longer to use lantern-light in day-time, which had become injurious to the eyes. Toward evening the sky became overcast, and at 3 of the next morning a violent snow-storm from the east set in, continuing Wednesday and Thursday evening and Friday morning. Wednesday the force of the wind was forty-six and Thursday fifty-three miles per hour. The gales and hurricanes we experienced in our winter quarters were dreadful, the contrary of those reported by Dr. Kane. We considered it a hurricane when it blew with a force of fifty-one miles per hour. Friday noon we examined the traps for wild animals, which we had laid some days previously, and found a white fox caught at the foot. The traps had been placed on the land, at the distance of three to four miles from the ship, on account of our dogs.

Saturday, the 23d, changeable weather; temperature, —20°. Hans shot a seal, with a young one in its womb. Both skeletons and the skin of the young were preserved for the Smithsonian Institution.

Sunday, beautiful weather.

Monday, the 25th, changeable, with a temperature of —25°. The twilight at night had now grown so strong that we could read the tide-gauge without a lantern.

Tuesday, the 26th, mild, with calm, overcast sky and a light snow-fall. Three partridges were seen, the first this year.

Wednesday, the 27th, the temperature rose to 3° above zero, a warmth to which we were not accustomed now. Wind S.E., the light snow-fall continuing. Dr. Bessels, Mr. Bryan, and Joe went at 8 a. m., in a sleigh with fourteen dogs, on an excursion, intending to examine first a fiord emptying into the sea about twenty-eight miles south of our winter-quarters, and then to make astronomical observations and survey the coast as far as Cape Constitution, which could not be done by the ship when coming up, on account of fog.

Thursday, Friday, and Saturday there was a light snow-fall, but the temperature from 1° to 5° above zero, the sun exerting its influence over it.

Sunday, the 31st of March, the weather was also mild and beautiful. Two of the crew, instead of attending service, went out shooting, and killed a hare and eight partridges; these birds are snowy white and well covered with feathers; they must be approached close in order to see them. In the afternoon, Mr. Bryan and Joe returned with the sleigh, which had broken, for another. Dr. Bessels had remained with the stores on an islet in the mouth of the fiord, where he had found many petrefactions.

Monday, April 1st, Mr. Bryan, accompanied by Joe and Hans, started again to join him, taking two sleighs. Throughout this week the weather remained fair. The boats were now taken in hand, in order to fit them for the expedition to the north pole, in which it was intended to start, if possible, in the beginning of May. As the water in the strait had remained more or less open throughout the winter, it was thought practicable to reach the Pole by boats, probably better than by sleighs over the ice in the darkness of the early spring.

Monday, the 8th, at 11.45 a. m., Dr. Bessels's party returned; all well, bringing as trophies the carcasses of a seal and a polar bear. Of the former, Hans had killed two, but obtained only one. Dr. Bessels discovering another fiord to the southward of that to which he went first, had

divided the party, leaving Mr. Bryan and Hans at the snow-hut built by them at the mouth of the northern fiord, while he and Joe did go in one of the sleighs with eight dogs to the southern; and while entering the mouth of it they saw tracks of the polar bear, and blood at a hole, such as the seal makes for breathing, and where polar bears like to watch for them as their prey. After the examination of the fiord and starting back north, Joe suddenly saw the bear; both jumped from the sleigh with their rifles, taking hold of the dogs, Joe of five, the doctor of three. But these, when they saw the fierce beast coming toward them, could not be kept back, and had to be set loose, when they at once made furiously for the bear. After fighting them for five minutes, the latter made for Joe, who allowed it to approach within sixty paces, when he fired, reloaded quickly, and with a second ball finished the beast, which just had started for him again after recovering from the shock. Two of the dogs had kept back, but the other six fought bravely; one of them was thrown by a blow from the paw of the powerful beast so violently against an ice-clump that it was left for dead on the place, but the next morning it had returned to the snow-hut. Three of the dogs were wounded most severely, one, called by us Bear, which had firmly imbedded its teeth into the skin of the beast, unmindful of the severe blows of its paws. The poor creature, when brought back on board, was barely alive, but in a few days it recovered, being nursed carefully by all hands. The party had not been able to penetrate into the northern fiord farther than twenty miles, as it was full of icebergs, which evidently had come down from the glaciers abounding in the vicinity, but they could see from the tops of the icebergs that it extended in a southeastern direction as far as the eye reached; its shores are in part bounded by rocks rising vertically to a height of seven hundred feet. The other fiord, where the bear was killed, was found to be thirty-eight miles long, also full of icebergs, and surrounded by glaciers. The party had gone as far south as latitude 80° 45′ N., but did not reach Cape Constitution. As Hans had been with Morton when the latter discovered this cape, in Barry's expedition, and as he states that Morton did not go beyond the cape, the latter cannot have reached the parallel of latitude 81° N., as has been reported by Kane. Dr. Bessels intended to push on farther south, but was prevented by the steepness of the coast and the open water almost washing it; they had, at some places, to carry their sleighs. The open water extended as far south as they could see.

Wednesday, April 10, the weather remained mild and fair, but small snow crystals fell most of the day. From that day the sun did not any longer go below the horizon, although hid from us for a few hours by a high mountain in our vicinity. From April 12 to 20 the weather was still beautiful and calm, but the cold increased to from 10° to 37° below zero. On account of this uninterrupted fair weather and the cold temperature, there was now more ice in the strait than we had seen the whole winter; no open water at all could be seen from Providence Mount.

Friday, the 19th, at 6 a. m., Joe and Hans went in a sleigh with twelve dogs on a hunting excursion.

Sunday, the 21st, wind changeable; in the afternoon snow fell.

Monday, fair weather.

Tuesday, the 23d, at 2 p. m., a snow-storm from the southwest set in, ceasing toward evening.

Wednesday, fair, mild weather. At 9 p. m. it commenced to blow stiff from the northeast, with snow until midnight, when the wind increased,

accompanied by a snow-drift, not ceasing before the evening of the 25th. At 11 a. m. Joe and Hans returned from their excursion, bringing four musk-oxen. They had shot seven near Newman's Bay, but left the three larger in a snow-hut which they had built, the dogs not being able to draw them all. These animals generally herd in a number; they take flight when they see men, but not from dogs; they cannot therefore be approached without dogs.

Saturday, the 27th, mild weather. During the last week we were employed carrying the provisions and stores, which had been landed, on board. At 10 a. m. Mr. Chester, accompanied by Joe, Hans, and Fr. Jamke, left the vessel in two sleighs, to ascertain how far north the open water now extended, and on the return to bring home the three musk-oxen from the snow-hut.

Sunday, beautiful weather.

Monday, the 29th, in the evening, the weather changed to a gale from the N.E., which lessened somewhat in the morning of the 30th, but increased again in the afternoon, with snow-drift. The ship careened considerably by the pressure of the iceberg against her, by which she already had suffered damage, and eight men were employed that day in removing the ice, that she might gain room for the tide, and right with high water. During the night the gale and snow-drift were quite severe, and continued so.

Wednesday, May 1, at 10 p. m., Mr. Chester's party returned. The bad weather had permitted them to proceed only 20 miles toward Newman's Bay; open water they had not seen, as their route was too far inland. Newman's Bay, discovered and named by Captain Hall on his sleigh excursion, lies in about latitude 82° N. A cape which the latter had discovered in latitude 81° 42′ N. was named by him Cape Lübken. On the northern side of Newman's Bay, Mr. Chester's party had killed two musk-oxen. These had taken flight already at the distance of a mile, but the dogs caught up with them, and brought them to bay. The manner of defense of these animals was remarkable; they kept back to back, and, when attacked, jumped furiously five or six paces onward, and then retreated again to the same position, until the one was brought down by a ball, when the other defended the fallen till it was also brought down. In the night the gale abated, and the weather remained mild and fair throughout Thursday and Friday. Temperature 5° to 10° above zero. Friday evening Joe and Hans discovered, half a mile from the ship, the tracks of a polar bear. We were not allowed any longer to leave the vessel unarmed.

Saturday, May 4, in the morning a terrible storm from the N. set in, with furious snow-drift, continuing throughout the day, until Sunday morning at 4 a. m; its force was as great as 53 miles per hour.

Sunday a stiff breeze blew from the N.E. Temperature 5° below zero.

Thursday, the 9th, at 4 a. m., Mr. Meyer, accompanied by Captain Tyson, Joe, and Hans, started in two sleighs, the former to survey Newman's Bay and take observations, while the latter were to see whether they could find open water to the northward, the strait north and south of the ship being now bridged by heavy ice for miles. The party returned, all well, Tuesday, the 14th, at 8 p. m. Mr. Meyer had ascertained the northern head of the bay to lie in latitude 82° N.; it thence extended from 60 to 70 miles in a southeastern direction, averaging 7 miles in width. The party saw no open water besides a few strips where current and wind had parted the ice-fields. They had killed eight musk-oxen and four calves; the latter they had not seen before the old had

fallen, being hid by their long hair between the short legs. As the sleighs could not carry all this meat, the greater portion was left in a snow-hut on the spot.

Since the last gale the wind had mostly blown from the south, with a temperature above zero.

Friday, May 17, the two Esquimaux, with two of the crew, went in two sleighs to Newman's Bay, for the meat left there, returning Sunday, the 19th, at 5.30 p. m., after having killed two more oxen and four partridges. In the afternoon of that day the carpenter found, on an iceberg, about three miles from the ship, a dead leming, which evidently had perished by starvation. The previous week Krüger and I had caught in the mountains one of those animals alive.

Monday, May 20, beautiful weather. Temperature 20° above zero. In the afternoon we transported, by sleighs drawn by dogs and six men, one of the boats to the northward of Cape Lübken, four to five miles north of the ship, where, throughout the winter, as long as the ice had drifted up and down the strait, the most open water had been observed; the current being there stronger and the ice weaker, it could be expected that the latter would break up there first. To attempt, at this season, a sleigh excursion for the Pole, was out of question, and therefore the boats were to be held in readiness for the earliest chance of proceeding by them.

Tuesday, the 21st, the weather was beautiful. The thermometer rose, for the first time in 1872, above the freezing-point. We could now see distinctly how the snow disappeared by degrees, especially in the mountains. The salt-water ice also grew soft and watery. At 10.30 a.m. Joe, Hans, and two of the crew went for the meat still remaining at Newman's Bay. It had been observed that the musk-oxen came in a northwesterly direction from East Greenland. All those that were killed were met in the same vicinity, on a plateau which trended from the north side of Newman's Bay easterly between the mountains.

Thursday, the 23d, at 5.40 p. m., the party returned, bringing with them the snow-tents, sleeping-bags, and all the meat. This time they had not seen musk-oxen. A fresh breeze blew that day from N.E.

Friday, May 24, another boat was carried to Cape Lübken. Fresh breeze from the S.W.

Saturday, the 25th, provisions and stores were transported in two sleighs to the boats. That day the ice in the strait began to move, and narrow strips of open water were seen. Near the boats, which had been placed at the distance of about one hundred paces from the water, the ice broke and packed. In the afternoon Hans found, about three miles north of the ship, and to the southward of Cape Lübken, half a mile inland, on elevated ground, an Esquimaux sleigh, partly buried. Our men broke off the parts above the ground and brought them on board. There was other evidence that Esquimaux had been living near the place of our winter quarters, at least in summer-time. We had already, before the discovery of Hans, seen two spots with marks of a camp, at one of which the stones were still in position for fastening seven tents, and Captain Bord (Buddington?) had found there part of a lance, made from the thigh-bone of a seal. Joe and Hans killed in the afternoon a seal.

Wednesday, May 29, fair weather; light breezes, mostly from S.W. Temperature, 25° to 30° above zero. In the forenoon the two Esquimaux went in a sleigh on a hunting excursion.

Thursday, the 30th, at 10.30 p. m., R. Krüger and I left the vessel for a walk; we did go as far as twelve miles south of the ship, close up to

a mountain-ridge, where we found, in several places near some sweet-water ponds, tracks of polar bears, hares, and musk-oxen, those of the latter being fresh; and suddenly we saw two of these animals, with a calf, resting on the snow at the foot of a mount near one of the ponds, about five hundred yards from us. Seeing us, they jumped up, when we fired at once our guns at them. While I was reloading, my companion suddenly warned me that one of the animals was making at me behind my back, and, looking around, I saw it furiously running against me with all its speed. I quickly retreated until ready with my breech-loader. The beast came to a halt in the mean time, and was joined by the others for defense in their peculiar manner. We now fired again, but as we did so at a considerable distance, not daring to close in without dogs, only one, the female, fell, when the other, with the calf, took flight. As I had no more balls, and my companion only a shot-gun, we did not follow them. We returned on board at 8 p. m., and within an hour five of the crew left in a sleigh, with dogs, to bring in the animal we had killed, and to hunt up the two which had escaped. They returned Friday, May 31, at 6 a. m., with the three animals, having found and killed the two escaped. At 9 a. m. three other men were sent with a sleigh for one of the oxen left behind; they returned at 7 p. m. The temperature rose that day to 26° above zero, with a fresh breeze from the S.W. No open water was seen.

Saturday, June 1, 1.50 p. m., I, in company with three other men, left the vessel in a sleigh, with dogs, for a hunting excursion, taking along tents, sleeping-bags, provisions, &c. At 5.50 p. m. we had arrived at the place where still an ox lay, killed on the last excursion, about fourteen miles S.E. of the vessel, at the foot of the high mountains, where we erected our tent for an encampment, after having sent William Lindemann back to the ship with the ox. R. Krüger and Fr. Jamke kept behind with me. In the evening a storm set in from the south, which continued throughout Sunday, the 2d. In the afternoon of that day we went out hunting but did not see anything. Robert shot, in the evening, a partridge. and Frederick a little snow-bird.

Monday, the 3d, the weather was fine. At 8.30 a. m. we started out again, returning at 2.30 p. m., without having seen any animal, but numerous tracks and dung of the musk-ox. I found a partridge-egg and the head of a musk.ox, the latter apparently having lain there for years. I secured the horns, intending to keep them as a memorial, if God would permit the ship to return home. In the evening we killed, near the tent, three partridges.

Tuesday, the 4th, we were out from 5:30 a. m. to 11 a. m., bagging only three partridges, but we saw everywhere tracks of the musk-ox, as also bones and remains of other wild animals.

At 1 p. m. four others of the crew came in a sleigh to relieve us, and at 5.30 p. m. we arrived back on board, all well. The Esquimaux had returned Monday evening with two seals, which they had killed in Newman's Bay; musk-oxen they had not seen.

Tuesday Joe and Hans shot again three seals.

Monday, May [June?] 3, much water had entered the ship which her pumps would not throw out, being probably choked by ice; the pumps connected with the engine had, therefore, to be employed, and kept her free by working them for four hours each day.

Wednesday, May [June?] 5, the ship rising steadily above the ice under the influence of the warm weather, which now melted the snow and ice rapidly, we discovered a dangerous leak on the starboard side of the stem at the six-foot mark, where two planks had split from the

careening of the ship. We hope to be able to return in the vessel, with God's aid, although it is now questionable, as she has suffered much. At 11 p. m., when sitting with R. Krüger in our quarters on the berth-deck in the fore part of the ship, we distinctly heard the water entering her, it then being flood-tide and the water gathering around her over the ice.

Thursday, the 6th, we endeavored to stop the leak, but could not do much, as the stem proved to have broken too deep below the water-line.

Friday, May [June?] 7, there was considerable open water. At 8 p. m., Mr. Chester, Mr. Meyer, Fr. Jamke, Fr. Anting, R. Krüger, and myself left the vessel in a sleigh with our things for the boats.

Saturday, the 8th, in the morning, we brought one of the boats, the Grant, into the water, and shipped our things in her. At noon we started for a reconnaissance. After rowing about a mile, we were stopped by an ice-field, on which we drew the boat. In the afternoon we transported her over the field about a quarter of a mile, where there was again open water. But after working the boat ahead about one and a quarter miles, we were compelled to draw her again on a great floe between icebergs, which rested with their foot on the shore.

Sunday, May [June?] 9, at 6 a. m., Fr. Anting had the watch. Mr. Meyer and Mr. Chester, who had in the evening laid down about twenty yards from the boat before we had pitched the tent, lay still there, while Jamke, Krüger, and myself were lying in the tent close to the boat. All at once, Anting called out that a great field of ice was approaching directly upon us, and before we could leave the tent we were drifting, and in a few minutes after one of the icebergs broke by the pressure of the field, and, in falling, crushed the boat into a thousand fragments before we were able to save it. With God's aid not one of us, however, was hurt, although the three others had but a narrow escape by running on the shore. After the pressure had ceased, we were able to gather but a few things. Mr. Meyer and Mr. Chester rescued most of their clothes, but myself and the others lost all except what we had on our bodies. Happily we were only seven miles from the ship, and reached her in the afternoon safely.

Monday, May [June?] 10, preparations were made for another boat expedition in the patent sail-cloth boat, and in the afternoon Dr. Bessels, Captain Tyson, H. Hobby, F. Jansen, William Lindemann, and G. Linquist left in her.

The Polaris we will hardly keep afloat, as she settles by degrees deeper the more the ice upon which the ship rests melts. She now makes considerable water, and there are probably more damaged places under the bow beneath the water-line.

Wednesday, June 12, at 10 a. m., we [not stated who; probably Mr. Chester's party, who were to follow Dr. Bessels in another boat.—E. R. R.] left the ship and reached at noon the place north of Cape Lübken where our boats stood. Hans and Joe, who had brought us there with the dogs, returned here to the vessel. That day the water was not open.

Thursday, the 13th, in the afternoon, there was a narrow opening, through which we worked two and one-half miles, when the ice compelled us to draw the boat upon the shore.

Friday, the 14th, in the afternoon, the ice separated a little; we pushed the boat into the water, and worked two and one-half miles north, when we had to draw the boat on a great ice-field, as we could not reach the land on account of icebergs and heavy ice, which had packed under the shore. In the evening the wind veered north, increas-

ing to a strong breeze, when the field upon which we were began to drift; it was surrounded on all sides by drift-ice, which prevented us from reaching the coast, and we could not prevent drifting until 7 in the morning of the 15th, when we were set back south of Cape Lübken. At that hour the drift-ice separated from the field, the strong wind having opened the water considerably. We immediately pushed the boat into the water and rowed uninterruptedly until 7 in the evening, when we reached the other party, which had left Monday, on a great ice-field, at the mouth of Newman's Bay, where the ice had not yet broken up. Latitude, 81° 55′ 26″ N.

Sunday, the 16th, wind baffling; beautiful weather; no open water; ice setting south.

Monday and Tuesday (18th) it blew stiff from the S.W. The entire strait was covered with heavy ice, which now drifted rapidly north. Throughout the night a gale blew from S.W.

Wednesday, the 19th, wind baffling; ice everywhere.

Thursday, June 20, a strong breeze from the north commenced at noon.

Friday, the 21st, storm from the north, with thick fog. The ice coming rapidly from the northward, drifted, heavily packed, southward. In the afternoon, light snow-fall, with cold temperature. The storm from the north continued throughout the night.

Saturday, the 22d, beautiful weather, with variable wind. We were still together on the same ice-field.

Sunday, June 23. In the morning we at last saw, north of us, a strip of open water, and left the field immediately, but had hardly rowed two and a half miles when heavy pack-ice advanced upon us rapidly. As we could not find in the vicinity an ice-field for a station, the harder of the firm ice being covered by packed ice, we were compelled to row back half a mile, where we met one, and had barely time to draw the boat upon it. The other party had done the same half a mile south of us. The position of our field was found to be in latitude 81° 57′ 26″. In the evening northerly wind set in, blowing strong throughout the night.

Monday, the 24th, the same strong wind continued, with snow-squalls. Heavily packed ice drifted continually south past us.

Tuesday, the 25th, strong breeze from the north with cold temperature. As our patent boat, the Heckelmann, was not stout enough for carrying a heavy load in such turbulent waters, (it was square fore and aft, and not faster than at most three miles per hour in quiet water,) we had only a scant stock of fuel, and had for the last three days only been able to cook coffee once a day; before that time we had cooked it twice a day. Besides the coffee, our meals consisted of bread, pemmican, and preserved meat, which we ate cold. We had no tents with us, and for a cover only gutta-percha blankets and our clothes-bags, with many holes in them, through which the cold northerly wind readily entered. Frequently when sleeping the ice melted under our bodies, and we awoke in a pool of water, our sleeping-bags well drenched.

Wednesday and Thursday, the 27th, wind north, stormy, with snow-squalls and fog, the ice continually drifting south. As provisions became short and the fuel was almost entirely consumed, R. Krüger and I, at Mr. Chester's wish, started at 11.30 p. m. for an attempt of reaching the ship by the land, in order to get more provisions. We went by Newman's Bay, and it was truly a severe task to climb over the high mountains and through the deep ravines where the sharp stones, split by the frost, cut through our Esquimaux boots. We made the distance,

however, in twelve hours, arriving at 11.30 a. m. of the 28th of June. The ice in Polaris Bay had, for the greater part, broken up, and the vessel lay in open water, in her old berth close to Providence Mount, which still was aground; but she was in a poor condition, making so much water that the pumps had to be worked for sixteen hours out of twenty-four. Mr. Schumann, the engineer, told me that on the 27th, while the scruppers allowing the water in the ship to flow aft had become choked, so that the pumps could not reach the water, much had entered the forward store-room and destroyed a great quantity of provisions. Luckily the water did not reach the fires; steam could be got up in both boilers, and the pumps of the engines be used for freeing the ship. As there were now, besides the cook and we two, no sailors on board able to steer the vessel, Captain Bord, would not permit us to leave again; he attempted to take the vessel to the boats, as the water appeared to be pretty open. At noon of that day, the ice-anchors were taken in and the ship proceeded north with steam and under sail, but we had hardly made half the distance to Newman's Bay when she was brought up by great ice-fields and heavily-packed ice drifting down upon her. During the night she was permitted to drift under shortened sail with the ice in the strait to the southward.

Saturday, June 29, in the morning, we again attempted to push on north, but failed. At 11 a. m. Hans was landed at a ravine north of Cape Lübken, in order to inform Mr. Chester and Captain Tyson that they must come with their boats back on board as early as possible. The ship then returned to Providence Mount, where she arrived at 1 p. m.

Sunday, June 30, the weather was fair and pleasant. In the morning we succeeded by great labor, severe for so small a crew, in fishing the anchor which had now been lying on the bottom for nine months, and had imbedded deeply into the mud.

Monday, July 1, we set Captain Hall's grave in order, covering it with stones, so that the earth could not be blown off,. and planting a sign-board with the name cut in. That was the last we could do for our beloved commander.

At 8 p. m. Dr. Bessels returned with Hans from Newman's Bay. They had a hard travel for twenty-seven hours, having searched long in a ravine for a place where they could climb up, but with great difficulty. Mr. Chester, having, besides Mr. Meyer, only two men, was anxious that another should be sent him; but Captain Buddington thought the land-route to be now too dangerous, as the water had begun to pour powerfully from the mountains into the great ravine. He preferred another attempt to reach the party with the ship, starting at midnight under steam and sail. The wind was from the S.W., and from Polaris Bay much open water was visible to the N. At 1 o'clock the wind changed to a gale from the N., and at 2 p. m., not having made half the distance, we came to the border of ice, which, closely packed, was drifting against us. The coast was there too steep to climb it. We set sail, and permitted the vessel to drift. At noon of the following day we were off the ravine where Hans had been landed before. As one man could not go well alone, I was sent by Captain Bord [Buddington?] with him. Considerable snow was still lying on the mountains. We landed at 1 p. m. with a small sleigh for transporting the bread, fuel, and other small things which the party was in need of, but we had not gone the third part of the distance when the sleigh broke, and we were compelled to carry each sixty to seventy pounds on our backs over the steep mountains and through the deep ravines. It

was the most trying travel I ever had in my life. In some of the ravines the water reached almost to our arm-pits, and we had then to climb up their sides on our hands and knees; but with God's aid we reached, at 4 o'clock in the morning of Thursday, the 4th of July, safely, the boat, after thirty-nine hours, during thirty-eight of which I had no dry foot. Since we had left them they had no chance to move either north or south. We carried a letter of Captain Bord [Buddington?] to Mr. Chester, in which the former stated that if, after consultation with Captain Tyson, they chose to continue their attempt of pushing north in the boats he was not the man to prevent it, but in his opinion it was preferable that they should return on board, as there was better prospect to push on north in the steamer, should a chance offer, than in the boats; we would then be able to free the ship from the water by the hand-pumps instead of the pumps connected with the engine, the coals for which were almost exhausted.

Friday, July 5, Mr. Chester was anxious to reach in the boats at least the 83d degree of latitude, from where he intended to proceed farther with the sleighs on Grinnell Land, which extended north; but Captain Tyson preferred to go on board, after securing his boat and stores on the southern coast of Newman's Bay in a ravine, one and a half miles inside of Cape Sumner. Mr. Chester detached one of his men, Fr. Anting, to the other party, and as there was no chance at present for Chester's party to go on, we all helped Captain Tyson. It took from Friday, 11 a. m., to Saturday, 9 p. m., to move the boat with the stores to the place selected by Captain Tyson, in which two men narrowly escaped drowning. The distance was said to be five miles, but there were many bad places, clefts and packed ice causing difficulties and delays, and we had often to wade through deep water. Having thus secured the boat, Captain Tyson's party went overland on board. In the succeeding night rain fell some hours, for the first time in 1872; wind north.

Sunday, the 7th, wind from the same quarter, and foggy. As there still came too much ice down the strait, there was no prospect that day of reaching either Cape Renard, on the northern side of Newman's Bay, or Cape Inricen, on Grinnell Land. Toward midnight it commenced to rain, and continued to 5 a. m. of Monday the 8th. Throughout that day there was a thick fog with a light snow-fall. The entire strait was more full of heavily-packed ice than we had ever seen. Light breeze from the north.

Tuesday, July 9, at 3 a. m., a great ice-field drifting upon us, crushed the smaller one above that upon which we were encamped, so that we then lay in our sleeping-bags not farther than twenty yards from the water. During the night and throughout the day there was a light breeze from the north, with snow-squalls and foggy weather. Heavily-packed ice continued drifting down from the north.

Wednesday, the 10th, thick fog, with a stiff northerly breeze. At 4 p. m. the ice opened a little to the southward, and Mr. Chester concluded to take advantage of it for going on board, as there appeared to be now no chances whatever for proceeding north in the boat. At 6 p. m. the boat was pushed into the water, and we started, but had hardly rowed two and a half miles when we were compelled, on account of the drift-ice besetting us again closely, to draw the boat on a small ice-field. Toward the evening the sky cleared and the wind went down.

Thursday, the 11th, pleasant weather with a light southerly breeze. The ice in the strait came to a stand, and remained so nearly the whole day.

Friday, July 12, weather warmer than it had been this year. Light variable breezes. The strait packed with heavy ice.

Saturday, the 13th, in the forenoon a strong breeze set in from the S.W. There being no prospect under these circumstances that the ice would soon open and allow us to proceed, Mr. Chester deemed it now advisable to land the boat and stores by the sleighs and take us on board overland. At 2.30 p. m. everything was on the sleighs, and we started. The wind increased and, together with the roughness of the ice, made progress so difficult that it became necessary to lighten the sleighs; we dropped the sleeping-bags and some clothing. When half a mile from the shore, on a great ice-field, we left the sleighs in order to get the things which we had dropped, and land them first; but on the return the wind increased steadily, the puffs which came down from the mountains throwing some of us to the ground several times. Nevertheless, we had to hasten as much as possible, as the ice bordering the shore was fast breaking up. An hour after midnight, at last, we reached the land at Captain Tyson's boat, thoroughly wet and almost broken down. To save the sleigh and the boat now was impossible, as it blew so violently, with snow and rain squalls, that at times we could hardly keep on our feet. We pitched the tents of Captain Tyson, took a scant meal, and lay down. But soon the tents were blown away. We then lay down in the boat, which had a canvas cover. There was, however, but little rest for us, as in the morning (Sunday, 14th) the boat, with everything in it, we included, was, by a terrible squall, carried a distance over the ground and thrown against rocks, by which two planks were broken, so that it now had a great hole in the bottom. We quickly jumped out to secure it, but it was caught by another gust and turned bottom up. By drawing a line several fold around the boat and fastening the ends to heavy rocks we finally succeeded in securing it. A quantity of clothing and light things, however, had been blown into the water. We then carried the tents a distance into the ravine, where we pitched them under the lee of the cliffs, and could now, at 9 p. m., seek the rest we so badly needed.

Monday, the 15th, the storm blew no longer so violently. During the night, however, the ice had parted entirely from the coast, so that we could not get at our boat and the sleigh.

Tuesday, the 16th, the storm continued blowing from the S.W. We tried in vain to reach the boat; there were too many and too great openings between the drifting ice-floes. As there was no chance for it before the wind would veer round to the north and set the ice again to the shore, Mr. Chester directed Mr. Meyer, Fr. Jamke, and R. Krüger to go on board, while he and I remained to save the boat, if possible, with the Lord's will. Krüger and Jamke left at noon, and reached the ship in 12 hours, while it took Mr. Meyer, who left at 2 p. m., 28 hours, as he lost his way in the snow-drift, which set in shortly after he left, and had to wait behind a rock until the weather cleared again.

Wednesday, July 17, Mr. Chester and I went along the coast trying to find a place where we could get to the boat. At Cape Sumner, the southern promontory of Newman's Bay, we at last espied a chance and succeeded happily, although with great danger, in crossing the broken ice and reaching the field upon which our boat was still standing. We had left the tent at 3 p. m., and at 6 p. m. the boat was safely on the shore. The weather was unsettled throughout the day, with rain-squalls, and during the night a gale blew from the S.W., with heavy rain, intermixed with snow. In the morning we found that the ice-field upon which our boat had stood had been broken up and had drifted

away with the ice over which we had walked; nothing but drift-ice was now at that place.

Thursday, the 18th, wind variable with snow and rain squalls. The strait beset by the ice everywhere.

In not one of the former expeditions has drift-wood been found or observed in Smith's Sound, and Dr. Petermann infers from its absence there, while it is met with on the east coast and in other parts of Greenland, that that so-called sound must, in fact, be a bay; but we found twenty-five pieces of drift-wood on the strand of the southern coast of Newman's Bay, about one and a quarter miles inside of Cape Sumner. Twenty-four pieces lay in a distance of a quarter of a mile; they were from 5½ to 18 [not stated whether feet or inches] in length, and 1½ to 4 inches in diameter, and around some of them was still the inside bark, (*Bast.*) I measured them, together with Mr. Chester. We used it up, partly for fire-wood, after drying the pieces still wet.

Sunday, July 21, wind variable; covered sky.

Monday, July 22, as the strait continued to be beset by ice, and our provisions began to fail, Mr. Chester concluded to go with me on board the ship, leaving the boat, with its contents, where it now was. We started at 1 p. m., with as much of our clothing as we could carry, and, although retarded by a strong wind ahead from the S.W., reached the ship at 11.20 p. m.

In consequence of the great pressure of the packed ice, which had, by the southwesterly gales, been driven in great quantities into Polaris Bay, Providence Mount had, on the 20th, during the flood-tide, parted, and the broken pieces had pressed the vessel upon the strand, where, at low water, she had been lying so much on one side that the water almost reached the deck. But, when we came on board, she had, with God's help, been floated again, and appeared not to have been damaged by it.

Tuesday, the 23d, beautiful weather, wind variable; everywhere ice.

Wednesday, July 24, a gale blew from the north, which opened Polaris Bay to some extent. The gale lasted until the morning of Thursday, the 25th, when the weather became pleasant, and continued so throughout that day. In the afternoon Captain Buddington disconnected the pumps of the engine and divided all hands, the women and children excepted, into three watches, each of four hours, for pumping by hand. But after having been ashore she made not so much water, by far, as previously, some of the parted seams having probably closed again. As the four pumps did throw out a very great quantity of water, we needed to work them only a few minutes each hour.

Friday, the 26th, beautiful weather, with variable wind. The ice setting close together for a few hours and then at a stand. Saturday, Sunday, and Monday (the 29th) the weather remained pleasant. Light baffling breeze. The strait full of large ice-fields and packed ice.

Tuesday, the 30th, covered sky, with rain. Wind, in the morning, N.W., changing at noon to a stiff breeze from the N.E., which continued past midnight.

Wednesday, July 31, in Polaris Bay, light breeze from the N.W., with covered sky, and fog for some hours, but north of Cape Lübken it appeared to blow stiff from the N., opening a strip of open water from there to Franklin Bay.

Thursday and Friday, (August 1 and 2,) weather pleasant, with a light variable breeze.

Saturday, the 3d, from 2 o'clock at night to 6 in the morning, strong breeze from the east, with rain.

Sunday, pleasant.

Monday and Tuesday (5th and 6th) the same.

Wednesday, the 7th, wind S.W., blowing strong in the strait, but baffling near the ship. At 2 p. m. H. Hobby and R. Krüger started to Newman's Bay for the clothing and other things left there. They returned Friday, at 9 a. m., with as much as they could carry. The weather was pleasant that day, and no wind. Some open water was visible from the vessel to the southward. As valuable instruments and good clothing still remained at Newman's Bay, Mr. Meyer, G. Linquist, and myself went there at 11.20 a. m., and arrived as early as 7 p. m. A light breeze from the S.W. had set in in the mean time.

Saturday, the 10th, at 1 a. m., we left the tent at Newman's Bay, and returned at 11 p. m. to the vessel. Off Newman's Bay the strait was beset all over, not a single strip of open water being visible.

Monday, August 12, in the morning, the wife of Hans gave birth to a boy.

In the afternoon the ice began to loosen and some strips of open water appeared. At 4.40 p. m. the vessel left Polaris Bay with northerly wind. We worked during the succeeding night, with great difficulty, through the ice until 8 a. m. of the next day, (the 18th,) when we were compelled, by the density of the ice, to fasten the vessel to a large floe near a small island on the Grinnell Land side, in latitude 80° 48′ N. We were now without ground-tackle. On one of the anchors part of Providence Mount had fallen when it broke, and the other, which was dropped when the vessel was pushed by the broken parts of the mount against the shore, lay likewise beneath grounded ice. We had left in Polaris Bay a considerable quantity of provisions and stores of all kinds, except fuel. The boats left at Newman's Bay we missed very badly. We drifted that day with the ice slowly to the southward, there being no wind, and the weather beautiful. In the night, when we saw near us a strip of open water which appeared to extend several miles to the southward, we made repeated attempts, with the full power of the engine, to break through the ice surrounding us, but could not succeed, and had to tie the vessel up again. The wind was light from the southward.

Wednesday, the 14th, at noon, the ice in some places not being pressed any longer so densely, we took our ice-anchors in and pushed on, with a light southerly breeze and fair weather. At 2 p. m. we passed Cape Constitution, in latitude 80° 30′ N., and worked steadily on until 11.30 p. m., when the ice had closed in again, and nothing remained but to tie up to an ice-field.

Thursday, the 15th, fresh northerly breeze, driving us with the ice slowly to the southward.

Friday, the 16th, still beset. Light breeze from the eastward. In the forenoon we saw near us, close to a small opening, six narwals, [probably walrus.] Latitude at noon 79° 59′ N. Toward 10 p. m. a thick fog set in.

Saturday, August 17, a fresh northerly breeze, commencing at 3 a. m., diffused the fog, but increased to a gale blowing throughout the day.

Sunday, the 18th, light breeze from the north. At noon, in latitude 79° 44′ 30″ N. We still lay tied to the same floe to which we had fastened on Wednesday; beset by heavy ice in which no opening was visible.

Monday, the 19th, beautiful calm weather. At noon we tried in vain to change our position to less heavy ice. As the ship might be destroyed any moment by the dense ice incasing her, provisions, stores, and fuel were kept on deck ready for landing on the ice.

Tuesday, the 20th, fine weather; light breeze from S.W.

Wednesday, the 21st, a fresh breeze from the north set in in the morning, veering around in the afternoon to the S.W., and decreasing then in strength. At noon the fires were drawn, as both boilers leaked and had to be repaired. We had now to work the pumps by hand, the ship making twice as much water as in Polaris Bay, as she had received many hard knocks since we left.

Thursday, the 22d, during the night, a stiff breeze had blown with snow-squall and a cold temperature, but in the morning the wind lulled down to a light southwesterly breeze with a covered sky.

Friday, the 23d, stiff breeze from the S.W., with a clear sky. Latitude at noon 79° 36′ N.

Saturday, fresh breeze from the north; covered sky.

Sunday, fair weather and calm.

Monday, the 26th, the same. Observing in the forenoon that the ice toward the west coast opened a little, steam was got up immediately, but in the mean time it had nearly closed again, and we could only push half a mile closer in shore.

Tuesday, August 27. Light breeze from the north. We had now for some days been almost stationary, probably because the ice had packed in the narrow part of Smith's Sound. In the evening the ship was towed between the fields about a quarter of a mile.

Wednesday, the 28th, we saw to the S.W. pretty open water, but as the vessel then lay hemmed in between two fields, with some heavy pieces fore and aft, we could not move, although we labored the whole day to remove these pieces. Light breeze from the east.

Thursday, the 29th, beautiful calm weather. In the evening we again saw a large stretch of open water. The fires were instantly lighted, and we labored throughout the night with the full power of steam, and besides all hands outside the vessel on the ice, but could only carry the ship within about one hundred and fifty yards of the open water, where, at 5.30 a. m., we were compelled to tie her up again.

Saturday, August 31, light northerly breeze with covered sky. A few drops of rain fell in the evening. From April 10 to August 26, one hundred and forty-three days, the sun had not gone below the horizon.

Sunday, September 1, light breeze from the north, with covered sky and rain.

Monday, 2d, light breeze from the southwest; obscured sky and rain. Toward the evening it began to snow so thickly that we could not see the coast, ceasing two hours past midnight, when a strong breeze sprang up, blowing till late in the morning.

September 3, fair weather. Latitude at noon, 79° 34′ N. At 7 p. m. fog set in, and the wind wore north.

Wednesday, the 4th, light baffling breeze with fog.

Thursday, the 5th, fair weather; wind north, light breeze. Latitude, 79° 32′ 15″ N. We tried to stop the leaks of the vessel without success. Fog throughout the night.

Friday, the 6th, fair weather, wind variable. In the morning the young ice was already strong enough to bear our weight, where three days ago the water had been open. In the shade it froze throughout the summer, the rare occasions excepted when rain fell.

Saturday, the 7th, wind and weather the same as the day before. In the evening a strong breeze from the north set in, blowing to Sunday evening. Latitude, Sunday noon, 79° 30′ N., the ship drifting very slowly south.

Monday, the 9th, light breeze from the north with thick fog.

Tuesday, Wednesday, and Thursday, September 12, light northerly breeze, and for the most part obscured sky with fog.

Friday, the 13th, light breeze from the north. Latitude 79° 21′ 30″ N. The sun sets now as early as 8 p. m., and does not rise before 5 o'clock.

Saturday, the 14th, fair calm weather.

Sunday, the 15th, light breeze from the northeast, with fog.

Monday, the 16th, fair. In the afternoon Hans shot a seal.

Tuesday, the 17th, light northerly breeze. Latitude at noon, 79° 19′ 50″ N.

Wednesday, the 18th, fresh breeze from the north. Hans shot a seal in the forenoon, and Joe saw two walrus, one of which he wounded, but it escaped. In the night snow fell for some hours.

Thursday, the 19th, light southerly breeze with dark sky. We again tried in vain to stop the leak; the engines had to pump constantly.

Friday, the 20th, a gale from the north commenced in the morning.

Saturday, the 21st, snow fell for some hours of the morning, when the storm abated, ceasing in the evening nearly entirely. We had a small boiler on board, so arranged that the water could be heated by oil. Mr. Schumann connected this with the engine in order to work, with the steam thus raised, the small pumps. By 1 p. m. he had it working, and was now able to save two-thirds of the coal used heretofore.

Monday, the 23d, light northerly breeze.

Tuesday, the 24th, stiff breeze from the north with heavy snow from 4 to 11 a. m.

Wednesday, September 25, light breeze from the south with snow in the morning, increasing an hour after midnight to a snow-storm.

Thursday, the 22d, at 8 a. m., the storm abated, and toward evening the snow also ceased.

Friday, the 27th, fresh breeze from the south, with obscured sky, increasing at 4 p. m. to a gale, which abated at 4 a. m. of Saturday, when it remained quiet. The seal killed that week by the Esquimaux were very welcome, the meat for food and the blubber for fuel.

Sunday, the 29th, fresh breeze from the north, with cold temperature.

Monday, September 30, light northerly breeze. There were this morning quite a number of open places north and south of the ship, and also near her the ice began to work with great noise; but the fields still incasing her prevented us from reaching the opening to the southward. At noon we were in latitude 79° 02′ N. Since August 15, when we tied up the ship to the ice in latitude 80° 02′ N., we had drifted, in one and a half months, 60 miles to the southward. During the night there was a thick fog, caused evidently by the open water; it did not rise much above deck, and in the rigging the sky was quite clear. The thermometer fell to 1° and 2° below zero, for the first time in the autumn of 1872.

Tuesday, October 1, beautiful clear sky, light breeze from the north. Much open water to the southward, the ice around the ship continuing to work powerfully, piling the young ice, which averaged six inches in thickness.

Wednesday, the 2d, in the forenoon light northerly breeze, veering south in the afternoon, with fog. We were about twenty-three miles N.W. of Kane's winter-quarters, and could see the harbor plainly in a clear sky. The ice still very unquiet.

Thursday, October 3, fair and clear. Latitude at noon, 78° 58′ 30″ N. In the forenoon Joe shot a seal eight feet in length and six feet in

circumference. It was a great luck that these animals were so abundant. Mr. Meyer, having the [word omitted; probably "scurvy"] in a high degree, grew much better by using the meat and blood of them. That day we began to erect a house on the ice-field to which the ship was fastened, as the latter was in great danger of being crushed, and, moreover, the winter now approached fast.

Friday, the 4th, light northerly breeze. We worked on the house. Four seals were killed that day.

Saturday, October 5, fresh breeze from the N., cold. We were engaged to alter the snow-cover, which had, last winter, been stretched over the ship, into a cover for the house.

Sunday, the 6th, light northerly breeze. Light snow-fall in the morning. Latitude 78° 57′ 28″ N.

Monday, October 7, mild, with light northerly breeze. Worked on the house, and carried ice into the ship, which Mr. Schumann intended to use for the small boiler working the pumps, as the salt water had crystallized in it to a great extent. In the afternoon Joe shot a seal and discovered that he had been tracked the day before close to the ship by a polar bear, which the dogs had not scented, the wind being against them; they are generally very keen in this respect.

Tuesday, the 8th, light northerly breeze. Worked on the house. Latitude 78° 47′ 45″ N.

Wednesday, the 9th, light breeze from the N. We carried a store of bread into the house. In the afternoon one of the crew saw a polar bear between the ice-fields, at a distance of a mile from the ship. Latitude, 78° 45′ N.

Thursday, the 10th, fresh northerly breeze, overcast.

Friday, the 11th, the same. Saw much open water.

Saturday, October 12, we had a gale from the N.E., with cold temperature. Much open water. Drifted more rapidly to the south. We were now about three miles from the coast of Greenland. This week the Esquimaux had killed ten seals and seen one narwal, [probably walrus.]

Diary of William Morton, second mate of the Polaris, which was found on the ice.

1871.

Arrived at Fiskerneas, Greenland, July 27, at 4 p. m. Called for the purpose of securing the services of Hans Christian, the Esquimaux hunter, who accompanied Dr. E. K. Kane in his arctic expedition. We were disappointed, having learned he was living at Upernavik.

August 19.—Arrived at Upernavik.

October 24.—Sledge party returned to the ship, having been sixteen days absent. They reached the latitude of 82° 5′ N. Lost two dogs by death; shot two seals, but could not get them. Saw tracks of musk-oxen, rabbits, foxes, &c. In half an hour after they arrived Captain Hall took a severe turn of illness. The party were Captain Hall, Mr. Chester, Joe and Hans, hunters and dog-drivers.

Open water and young ice to the N. and W.

October 25.—Weather overcast and cloudy. Fed the sledge-dogs with seal-meat. Stopped with Captain Hall from 2.30 until 10 a. m., who is still very ill.

October 26.—Captain Hall remains confined to his bed. Joe and Hans went to open water in search of seals; fired at one but did not get it. Clear weather. Two stars visible at noon. Banking around ship.

October 27.—Captain Hall seriously ill, and Dr. Bessels has no hopes of him. He told Chester and myself so. Joe and Hans preparing to go on a musk-ox hunt. Crew banking round the ship. Two stars visible at noon; weather clear. Young ice making on the water. Thermometer 89.

November 11.—This morning Captain B. took possession of all the keys composing of ship's stores, and also of Captain Hall's effects, for which from this date I will not consider myself responsible for what may hereafter happen. Reported (?) yesterday the store-rooms were opened occasionally by the crew.

November 21.—Broke adrift from our position alongside of Providence Berg, which prevented us from drifting out in the pack. Let go starboard anchor and made fast to ice-berg by hawsers.

November 28.—A gale from southwest. Drifted Providence Berg in-shore. Broke the ice all around and pressed the vessel hard on the young ice formed in-shore of us.

November 30.—Celebrated Thanksgiving, viz: Oyster-soup, lobster, turkey, vegetables, fruit-pies, plum-pudding with brandy-sauce, cheese, coffee, crackers, almonds, raisins, walnuts, wine, &c.

December 1.—Mild weather. Got ice from berg.

1872.

February 28.—Thank God Harbor, Polaris Bay, latitude 81° 38′ N., longitude — W. Saw the sun for the first time at $11^h\ 47^m\ 0^s.2$, after an absence of one hundred and thirty-six days. Celebrated sunrise with a glass of wine.

Daily journal of Sergeant Meyer, kept while drifting on the ice.

October 15.—Heavy S.E. and S. gale, with heavy snow-fall; at 6 p. m. ice on the starboard set off, apparently by the action of two icebergs, which, indistinctly, might have been seen at a short distance. Big floes, driven by these icebergs, grazed along the ship until finally one (by passing rather close) sent the ship all a trembling and cracking in her timbers; the ship was lifted out of the water at least six feet, and the general belief was that the skin of the vessel was breaking; orders to "heave over" were given, expecting a sudden catastrophe about the vessel. But, strange, after some hard work, both on ship and floe, the ship became eased again, and the floe to which we were fastened broke up, at least at the edge, into small pieces; the lines which held the vessel broke off; the ship went adrift, leaving the greatest part of the crew, Captain Tyson, and myself on the ice. With difficulty we reached the remainder of the floe, and found ourselves in possession of two boats, some clothes-bags and musk-ox skins, fourteen cans of pemmican, fourteen hams, some can-meat, a small bag of chocolate, the tent built on the floe previously, and twelve bags of hard bread therein; besides an "A" tent, instruments, chronometer, &c. The floe kept on breaking off at the edge, and a continual removal of our stores, therefore, was necessary; we worked steady and hard until about 12

o'clock, night, and then, exhausted, laid down in the drifting snow and fearful tempest. All my papers and records are lost.

October 16.—Next morning wind had somewhat abated, and we found ourselves wedged in between an iceberg and land, which I took for Northumberland Island. Packing up, we left with the intention to round the iceberg and floe by boats, and reach the land; but ice closed in before we succeeded, and were compelled to take up our abode on the floe once more. Then the ship was seen under full steam and sail, heading (from a northerly point) toward the island. Later the ship arrived in harbor, between McGary Island (small) and Northumberland Island, and a new attempt to reach shore was made by pulling one boat across the floe, and then taking to the water; but again the setting in of the ice and of a northeast gale defeated us. Pulling the boat upon the ice, we left it, and returned to provisions and other boat.

October 17.—During the night northeast gale blew with full force, and continues now. Of the entire floe only a small piece is left us. The other boat, big tent, and part of the bread, &c., gone. We are far away from land. It is evident, as soon as this gale abates, we will have to arrange matters, and prepare for wintering on the floe without fire, unless the Esquimaux (Joe and Hans) are fortunate enough to kill a sufficient number of seals.

October 18.—All provisions in our possession will last us four months at the rate of three-quarters of a pound per day to the man.

October 22.—We have drifted between Northumberland and Wolstenholm Islands; sometimes close to the land. More or less heavy winds have prevailed, mostly southerly. We have settled down on our small piece of ice. Three snow-huts are built, for Hans's family, Joe's family, and ship's crew. Three seals have been shot, and we live on two meals a day, which each consists of a small piece of seal meat, boiled on an Esquimaux lamp, the soup given off by this meat, and about an ounce of bread. To-day a new addition to our snow-encampment has been made in form of a half-hut, joining by an entrance the hut of the crew. At present Captain Tyson and I occupy this new apartment as sleeping-room. If fortune would laugh on us, and send us plenty of game in the form of thirty or forty seals, (so as to secure a little light and fire besides the meat,) we might be able to weather out the winter, and finally arrive safely in some port of Greenland. What I regret most is the loss of my papers and records. With it a great many astronomical observations, all observations in reference to surveys, observation on magnetic horizontal intensity, meteorological observations, (hourly and corrected,) all comparisons for the verification of meteorological observations, &c., have left my possession.

October 23.—The wind still keeps up, (mostly from a southerly direction, but at intervals from N. and N. E.) Till now I have neglected to name the inhabitants of our snow-village. The roll is as follows:

ADDITIONAL APARTMENT.

1. Captain Tyson.
2. Frederick Meyer.

Crew's hut.

3. John Heron.
4. E. W. C. Kruger.
5. Frederick Jamka.

6. William Nindeman.
7. Frederick Anthing.
8. Gustavus Linguist.
9. Peter Johnson.
10. William Jackson.

Joe's hut.

11. Joe, Esquimaux.
12. Hannah, Esquimaux.
13. Punny, Esquimaux.

Hans's hut.

14. Hans, Esquimaux.
15. Hans's wife, Esquimaux.
16. Augustina, Esquimaux.
17. Tobias, Esquimaux.
18. Succi, Esquimaux.
19. Hans's baby, Esquimaux.

At about noon Joe sung out, "I see the boat," and certainly, by aid of glasses, we all saw the boat at about three miles distance to the eastward. Joe also thought he saw the big canvas tent. Just about then breakfast was ready; an extra allowance of bread was issued, and we all started out to get the boat, and, if possible, the bread, in the house. We arrived at the boat, (taking the dogs with us,) cleaned the latter of snow, and, with dogs and our own strength, pulled her across to the west edge of the floe, which existed yet nearly to its entire extent. The crew then went over to the tent, and carried the bread over to the boat. Starting anew, we pulled the boat, (with all the bread in it,) over hummocks, but most young ice, and arrived safely at our encampment at about dusk, (5 p. m.) By this fortunate expedition we gained the second boat, two boat compasses, one can of pemmican, twenty-seven two-pound cans of preserved meats, and six bags of bread, (most of them big bags, containing in all likely eight hundred pounds.) It then was decided to start anew next morning, if weather would permit, with the intention to reach the house once more, build a sled of a few planks and poles, which are in the house, tear the house down, and bring all over to the encampment. This was to be done by half of the crew and dogs, while the other half watched their movement, and be in readiness with a boat in case of necessity.

October 24.—It is blowing, and unless the wind moderates we dare not cross over to the house. It remained more or less windy all day, but still in the afternoon; four of the crew went over to the house, and carried back all boards and one plank.

October 25.—It is almost calm, but a little thick; still I think it possible to cross over to the house, cut it down, and bring it over here. For this purpose, Joe and Hans are now busily engaged to build a sled of the plank brought to our encampment yesterday. Four men and the two Esquimaux, with sled and dogs, crossed over to the house, and returned with about half of the poles of which the house-frame consisted. It will be utterly impossible to make any observations while bound to this floe, inasmuch we are nearly entirely destitute of light.

October 26.—Moderate breeze from the E.; temperature at 2 p. m. +5°. Sun showed 25′ of her disk at 12.35 p. m. Four men and two Esquimaux,

with sled and dogs, again went to the house, and returned with the remainder of the wood and half the canvas. All remaining on the big floe is enumerated by half of the canvas and two bags of coal. While the party was on the floe in order to load up the sled, two dogs (which, at the breaking up of the floe-edge on October 15, were left on one of the pieces of ice with provisions on) made their appearance, and great hope is entertained at present that we may be able to recover said provisions and (what is more to me still) Mr. Bryan's and my own papers.

October 27.—Heavy breeze from the N.E., moderated toward morning, clear; 10 a. m., temperature +2°.5; wind E., and still more moderating. Robert and the two natives (separately) went out in search of the provisions mentioned above; the natives were also to look out for seals. The sun showed 10′ of her disk. Part of the crew went across to the floe for the two bags of coal and remainder of the canvas. Temperature at 2 p. m. 1°.5. Robert returned, but had no tidings of the provisions. Joe and Hans have returned, and relate that they have fallen in with track of the dogs, (which joined our party yesterday,) and are determined to follow it up to-morrow. I hope they will succeed.

October 28.—Calm and clear during night; stiff breeze from the E. in the morning. Nevertheless, Joe and Hans are starting out with sled and dogs. They have returned, compelled to do so by a rather fierce wind, after following the dogs' track for some time. The wind compels us to turn in after 4 p. m., on a cold meal of bread and pemmican.

October 29.—Still a stiff breeze from the E. blowing. Robert built the stove, Joe the alley-way, and so at dinner our cook-house was finished. I at the same time had the scale finished, and six pounds of food were weighed out for the whole company's supper.

October 30.—Calm and clear. Natives have been out, but, besides seeing several seal-holes, brought no news of any importance.

October 31.—Calm and clear. Natives have gone out to search for a route to shore. It has been concluded to take proper meals to-day; and, if the ice remains quiet over night, to make a start toward shore to-morrow.

November 1.—Calm and clear. Two heavy boat-loads, containing all provisions, clothing, and beds, have been moved over to the big floe; one sled-load almost removed all the remainder. Kiaks, fire-wood, canvas, and some of Joe's goods are on the old piece yet.

November 2.—The ice between the two pieces of ice has opened; natives started early with a sled and found it so. Desperate efforts on the part of the natives; Bill, the cook, and little Bill and Robert, succeeded in removing on the quickly-formed young ice, kiaks, and the most valuable part of the goods from the other piece on to the big floe. They also built a snow-house for the accommodation of the crew.

November 3.—Thick and snowing; it is thought that we are adrift; if so, our hopes of getting back to the Polaris will not be gratified; all hands busy in building hut for Joe and a cook-house; breezing up in the evening.

November 4.—Calm and clearing up; floe surrounded by water; drifted about six miles to the southward; we are now below Wolstenholm Island; Joe and Hans went out hunting, but returned without game; some wood was got from the place where the big canvas hut stood. We have come back to the old allowance of three-quarter pound of food.

November 5.—Clear; blowing from the N.W. and N.; no work done, but compelled to stay in-doors.

November 6.—Clear and moderate breeze from N. and N.E.; we have

drifted to the southward and westward; Joe and Hans went out sealing; Joe returned with a seal, of which we had a proper meal of raw and cooked meat.

November 7.—Fair in the morning; snowing and light breeze during fore and afternoon; Joe and Hans went out hunting, but without success.

November 8.—Breezing up during night; snow drifting.

November 9.—Fair and calm in the morning; breezing up during forenoon; Joe and Hans out hunting.

November 10.—A moderate breeze; mostly clear; snow drifting; wind nearly N.; it appears that we are drifting very rapidly, and have by this time passed the Carrey Islands. Joe and Hans went out hunting after breakfast, or dinner, (whatever we may call it;) Joe returned before dark set in, but Hans was missing yet at 8 p. m. Robert and Joe went in search of him, and finally picked him up, Hans having lost his route.

November 11.—Still blowing from the northward, and snow drifting heavy; we have come down to one meal.

November 12.—Clear; blowing from the northward, but no snow drifting. Judging by the amount of light we have now daily, it appears that our drift keeps nearly up to the recession of the sun in south declination.

November 13.—Thick and snowing; light breeze; another load of wood was got from the place of the big canvas hut, and another snow-hut was commenced to store provisions in, and to serve as reserve-hut in case one of the others should break down; calm and clearing in the evening.

November 14.—Light breeze and snow in the morning, clearing toward noon; snow-hut completed.

November 15.—Calm and thick toward noon; breezing up from the S.E., with snow-drift.

November 16.—Clearing; northerly wind, but light.

November 17.—Almost clear; northerly wind (stiff breeze) and snow-drift.

November 18.—Wind N.W.; stiff breeze; low temperature.

November 19.—Clear, light breeze from the W.

November 20.—Clear and almost calm.

November 21.—Cloudy, but calm; moved into the new snow-hut, which is more comfortable than the old one; Joe and Hans caught a seal each.

November 22.—Calm and clear; Joe shot a seal; more or less water around the floe.

November 23.—Light northerly wind and cloudy; Hans shot a seal.

November 24.—Light northerly wind and calm.

November 25.—Clear and calm during forenoon; clouding up, and N.W. breezes during afternoon.

November 26.—Cloudy and westerly breezes.

November 27.—Cloudy and thick; light snow at intervals; westerly breezes.

November 28.—This day is celebrated as thanks-giving, by change of food; in regard to quantity, we cannot allow much more than our usual ration; cloudy and westerly breezes.

November 29.—Thick; light westerly breeze.

November 30.—Calm and almost cloudy; clear at the S.E.; land in sight, bearing apparently S.S.E. or S.

December 1.—Calm and clear; low temperature; Fred. encountered a bear, but his gun proved defective.

December 2.—Thick and stiff N.W. breeze; wind abating and clearing up; land in sight, apparently some part of the west coast of the channel.

December 3.—Light N.W. breeze; clear and quite light.

December 4.—Light N.W. breeze, and thick; temperature at 2 p. m., —9°; fair and calm toward evening; in our snow-hut temperature generally keeps one or two degrees above zero.

December 5.—Light N.W. breeze, and almost clear; temperature, —15°; Bill shot a white fox, who had come up close to our encampment, as he had done several times before.

December 6.—Splendid auroral display during the night; a dark segment over the horizon, extending from E. to W., whereof bright luminous streamers issued up to a height of about 30°; light N.W. breeze in the morning, and fair; temperature, at 12 m., —4° and rising to —1°; wind veering to the west.

December 7.—Cloudy and light breeze from the west; clear and light southerly breeze toward evening; a clear sky and clear horizon south give me an opportunity to take the meridian. Altitude of γ Cassiopeæ over the ice-horizon; the approximate declination of γ Cassiopeæ taken from a star-chart, (fortunately in my possession,) permitted me to find as an approximation to our real latitude the value 74° 4′ N. The chronometer time of Z, taken at meridian passage of γ Cassiopeæ, furnished an approximation to our longitude, which was found to be 67° 53′ W.

December 8.—Cloudy; light southerly breeze; temperature —5° at 1 p. m.; —12° at 3 p. m.; wind veering to the W. and N. of W.

December 9.—Cloudy; moderate breeze from the N.W.; temperature low and falling, ranging from —13° to —18°.

December 10.—Stiff N.W. breeze during night; wind abating toward morning; clouded over; temperature at 10 a. m., —17°; even while the sky is cast over we have considerable light at 10 a. m., Thank God Harbor time; light sufficient to read the thermometer accurately; during the day temperature fell to —21°.

December 11.—Clear and calm; temperature at 12 m., —26°; Hans caught a white fox by means of a trap.

December 12.—Westerly wind and fair; temperature at 12 m., —21°.5.

December 13.—More or less cloudy; westerly wind; temperature at 1 p. m., —19°.

December 14.—Beautifully clear and calm during night; temperature at 6 a. m., —25°; at 12 m., —25°.5; cloudy; clearing up during afternoon.

December 15.—Cloudy; light westerly breeze; temperature at 12 m., —20°.

December 16.—Cloudy; moderate westerly breeze; temperature at 11 a. m., —3°; at 4 p. m., —1°.

December 17.—Cloudy and thick, almost calm; temperature at 12 m., —4°; snowing in the evening; temperature at 7 p. m., +1°.5.

December 18.—Cloudy and almost calm; temperature 11 a. m., +5°.

December 19.—Fair; stiff northerly breeze; temperature at 11 a. m., +2°.

December 20.—Cloudy; light westerly breeze, and considerable twilight, which permitted to read at 2 p. m.; temperature at 1 p. m., +4°; water at the edge of the floe; seals seen by Joe and Hans.

December 21.—Cloudy and thick, but sufficient light at 10 a. m. to read print; stiff northerly breeze; temperature at 10 a. m., +9°; at 12 m., +6°; even at 3 p. m. the light was sufficient to read the thermometer.

December 22.—Calm and clear, very light; more so than it has been for some time past; temperature at 12 m., —14°.

December 23.—Light northwesterly breeze; land sighted, bearing about S.S.W. and S.W., but apparently rather far off; temperature at 11 a. m., —9°.

December 24.—Stiff northerly breeze; snow-drift during the night; auroral streamers during the night; at 6 a. m. beautiful corona, with flashing light extending from E. to W. through the southern sky; temperature at 12 m., +4°.

December 25.—Light northerly breeze; calm; temperature —1°. Christmas was celebrated by us with an extra meal, (Christmas dinner,) consisting of two biscuits, one-half pound of ham, and blood-soup each.

December 26.—Northerly gale and heavy snow-drift during night; somewhat decreasing toward morning; temperature at 10 a. m., +12°.

December 27.—Light northerly breeze; cloudy; temperature from +5° at 10 a. m., to +8° in the afternoon.

December 28.—Almost calm; water making to the east and northeastward; temperature from +3° to +1°; cloudy.

December 29.—Fair and light northerly breeze in the forenoon; temperature from —4° to —6°; at noon ice commenced moving and cracks opened; Joe shot a small seal; at the same time it breezed up and snow drifted from N. and N.W.

December 30.—Almost clear; stiff breeze from N.W.; temperature at 11 a. m., —10°; west coast in sight, but distance considerable.

December 31.—Almost calm, with exception of very light southerly and northerly breezes; clear; temperature from —21° to —23°.

January 1, 1873.—Almost calm and clear; temperature from —25° to —29°; hazy and light S.E. breeze in the evening.

January 2.—Wind changeable, but light; hazy; temperature from —18° to —23°.

January 3.—Stiff N.W. breeze; fair; temperature at 10 a. m., —23°.

January 4.—Stiff N.W. breeze; fair; temperature at 12 m., —24°.

January 5.—Light or moderate westerly breeze; fair temperature at 9 a. m., —24°.

January 6.—Calm or light southerly breeze; clear; temperature from —22° to —25°. A clear sky and horizon give me an opportunity to take meridian altitudes of Polaris and γ Cassiopeæ. Approximate latitude, (by means of declination taken from a star-chart,) calculated by Polaris, 72° 03′ 30″ N.; by γ Cassiopeæ, 72° 11′ N.; mean, 72° 07′ 15″ N. Approximate longitude by γ Cassiopeæ, (right ascension taken from star-chart,) 60° 40′ 45″ W. Our fire-wood (including one boat used for heating two meals a day) being used up, we managed to warm our meals by means of an Esquimaux lamp.

January 7.—Clear; light southerly breeze; temperature from —25° to —30°.

January 8.—Fair, but clouding up; light southerly breeze; temperature from —27° to —30°.

January 9.—Clear and almost calm; temperature in average, —35°.

January 10.—Clear; light S.E. breeze; temperature in average, —30°.

January 11.—Fair; light N.E. breeze; temperature, —33°.

January 12.—Clouding up; more or less strong breeze from N.W.; temperature, —33°.

January 13.—Calm and clear; temperature from —38° to —40°.

January 14.—Thick and light snow; moderate N.E. breeze; temperature, —16° at 10 a. m.; temperature rising to —12° in the afternoon; wind veering to N.W. and W.; setting in of W. gale.

January 15.—W. gale continues; heavy snow-drift; temperature falls to —17°; wind quieting toward evening.

January 16.—Thick; stiff N.W. breeze; temperature from —31° to —25°; Hans shot a seal—a most fortunate incident, inasmuch it permits us to warm our food for perhaps eight days longer; in another day or two we would have been compelled to live on three-fourths pound of dry cold food per day.

January 17.—Fair; stiff N.W. breeze; temperature, —25°.

January 18.—Fair; heavy N.W. breeze and snow-drift during night; slowly abating during day; temperature from —27° to —28°.

January 19.—Clear; almost calm; sun appeared above the horizon, remaining there for above two hours, and dipping at 10 minutes past one o'clock, Thank God Harbor time; her meridian passage was obscured by an iceberg; it is likely that the upper limb showed above the horizon on the 18th, but such could not be observed on account of the above mentioned iceberg; temperature from —27° to —32°; Joe and Hans shot two seals at a distance of five miles from the floe, where they found a large space of newly-made ice leading across the channel; only one they were enabled to get and fetch home, leaving the other one among the young ice.

January 20.—Fair; almost calm; temperature, at 9 a. m., —33°. Early in the morning I took sights of Polaris and γ Cassiopeæ at their lower culmination, and determined our approximate latitude and longitude to be 70° 1′ 40″ N., 60° 0′ 36″ W.

January 21.—Almost clear; light but sharp northerly breeze; temperature, —36°.

January 22.—Clear and almost calm; clouding up and light S.E. breeze toward evening; temperature from —39° to —32°.

January 23.—Fair; light N.W. and W. breeze; temperature from —31° to —35°. Joe caught a small seal in a seal-hole.

January 24.—Thick and light snow; light S.E. breeze; temperature from —23° to —21°; Joe and Hans returned from hunting with a seal, shot by Hans in a seal-hole.

January 25.—Clear; light N.W. breeze; temperature from —34° to below —40°.

January 26.—Clear; light N.W. breeze; temperature, at 10 a. m., below —40°; Joe shot a seal in his hole, and fetched him home; the same seal had been previously shot by Hans at another hole.

January 27.—Clear; light S.E. breeze; temperature below —40°; toward evening S. and S.E. breeze increased; temperature rose to —34°. Sights of Polaris, γ Cassiopeæ, and the sun give a mean determination of latitude to 69° 32′ N.; longitude, to 60° 03′ W.

January 28.—Clear; wind light and changeable; temperature below —40°.

January 29.—Clear; frost-smoke at the horizon; light S.E. breeze; temperature below —40°.

January 30.—Fair; almost calm; —34° temperature; during afternoon a breeze from S. and S.W. sprung up, sky clouded up, and temperature rose rapidly to —24°.

January 31.—Cloudy and thick; light S.E. breeze; temperature, —19°; toward noon wind veered to E. and N.E.; temperature fell to —24°; toward evening wind veered to N.W. and W., and increased to a heavy breeze; temperature fell to —26°.

February 1.—W. heavy breeze increased to a gale during night; somewhat abating toward morning; heavy snow-drift; cloudy; temperature from —22° to —19°.

February 2.—W.N.W. breeze, abating slowly; thick; light snow toward night; temperature from —19° to —16°.

February 3.—Cloudy; very light S.S.W. breeze; temperature rising from —16°; at 10 a. m. —13°.

February 4.—W. gale commencing at midnight; thick and heavy snow-drift, abating during afternoon; temperature, while gale lasted, —10°; falling when abating.

February 5.—Moderate breeze from the S.W., S., and S.S.E. during morning; fair; temperature at 8 a. m. —17°, and still falling; latitude by ☉, 68° —50′; Hans shot a seal; wind veers to W. and N.W.

February 6.—Moderate N. W. breeze; thick; temperature, —10°; during afternoon wind veers to N.E. and S., and blows heavy in the evening for a short duration; during the veering of the wind temperature rises to —5°.

February 7.—Fair; wind W. and moderate; temperature falls during the night, and in the morning varies from —24° to —26°; Hans shot a seal; unicorns seen.

February 8.—During night clear, and temperature falling; at 7 a. m. —30°; rising from 8 a. m.; —18° at 2 p. m.; stiff S.E. breeze springs up toward evening; temperature rises to —16°; unicorns seen.

February 9.—During night wind veers by the N. to W., and increases to a gale; somewhat decreasing during day; temperature, —10°; unicorns seen; heavy snow-drift.

February 10.—W. wind increases again during night; temperature, —10°; heavy snow-drift; calming down during day, and temperature decreasing to below —20°; Joe shot two seals.

February 11.—Breezing up after midnight from the N.W.; temperature rising; breeze and snow-drift increasing during day; temperature rising to —7°; thick.

February 12.—Heavy N.W. and W. breeze continues; snow-drift; temperature, in average, —10°.

February 13.—Heavy west breeze continues; temperature, in average, —10°.

February 14.—Heavy W. breeze, somewhat abating; fair; temperature at 8 a. m., —16°; calming down and clearing up toward evening; temperature falling to —19°; Hans shot a seal.

February 15.—Thick; breezing up from the W. toward morning; snow-drift; temperature at 8 a. m., —15°.

February 16.—Calm and light W. breezes; varying temperature.

February 17.—Calm and light W. breezes; varying temperature; temperature rising from —30° toward —20°; Hans shot a seal.

February 18.—Heavy W. breeze and snow-drift; fair sky; temperature, —25°.

February 19.—Light N. breeze; clear; temperature from —24° to —14°; Cape Walsingham and Pawn Bay in sight, the first bearing about S.S.W.; Joe shot a seal; ten dovekies were shot also.

February 20.—Thick; temperature from —8° to —4°; light E. breezes; considerable leads of water on all sides; thirteen dovekies shot.

February 21.—Thick and cloudy; calm; light southerly breezes; temperature at 7 a. m., +6°; rising during the day to +10°; Cape Walsingham and Sire Inlet appear now to be about twenty miles off.

February 22.—Thick and cloudy; calm during day; breezing up toward evening from the S.E.; temperature at 6 a. m., +5°, rising during day and coming up to +24°, with the S.E. breeze. Preparations are being made for an early start toward shore.

February 23.—Heavy S.E. breeze during night, abating toward

morning; thick and snowing; temperature remains above +20° during S.E. breeze; at 8 a. m. the wind shifts to the W., and temperature falls to +15° and +12°.

February 24.—Fair; moderate N. breeze; temperature varying from —8° to +2°; Cape Walsingham bearing S. and getting closer; Joe shot a seal.

February 25.—Fair in the morning; clouding up soon after; calm and light N.E. breeze; temperature from —9° to +5°; light snow in the afternoon.

February 26.—Light N.W. breeze, and calm; fair; temperature from —24° to —10°; starting for shore has been given up, and, therefore, in order to make our provisions hold out until the 1st of April, our allowance had to be reduced to seven (7) ounces of uncooked food per day.

February 27.—N. breeze; fair; temperature at 7 a. m., —25°; a bear has been disturbing Joe's hunting-gear, which he keeps not far off the hut; he is following up the bear's track; six dovekies shot.

February 28.—Stiff N.W. breeze; fair; temperature from —28° —20°; thirty-nine dovekies shot.

March 1.—Moderate N.W. breeze in the morning; calming down toward noon; fair; 65 dovekies shot; temperature from —34° to —18°.

March 2.—Moderate N.W. breeze; fair temperature, from —31° to —19°. Joe shot an uktshuk measuring 7 feet 8 inches in length; 42 dovekies were shot also.

March 3.—Stiff N.W. breeze; hazy; temperature from —23° to —20°.

March 4.—Clear and calm; temperature from —27° to —6°, and —34°; 4 dovekies shot.

March 5.—Fair; moderate N.W. breeze; increases to heavy breeze, and shifts to W.N.W.; heavy snow-drift.

March 6.—Heavy W.N.W. breeze, and snow-drift continues; fair; temperature, at 3 p. m., —20°.

March 7.—W.N.W. breeze somewhat abated; fair; temperature, at 7 a. m., —23°; heavy pressure on our floe during night; temperature rising to —20° during day, and falling to —23° toward evening.

March 8.—Calm and fair; temperature from —30° to —13°.

March 9.—Calm and thick; light N. breeze; rising during day; temperature, —22° at 6 a. m., rising to —10° toward noon; N. breeze increasing to heavy blow and snow-drift; toward evening the floe is cracking in all directions, and we are compelled to keep ourselves and all necessaries of life ready in case of a sudden disaster.

March 11.—N. gale still continues; thick and heavy snow-drift; toward evening the floe cracks into still smaller pieces close to the huts; temperature, +5°.

March 12.—Gale abating toward morning, and clearing up; the floe has completely broken up; the piece left to us is very small; but the number of huts is complete, and nobody lost; clouding up during the day, and wind shifting to S.S.E.; temperature, from +1° to +15°; Joe shot two seals, and Captain Tyson one seal; five dovekies shot; Hans shot another seal; latitude by ☉, 64° 32′.

March 13.—Stiff breeze from the N. and W.; ice grinding; thick in the morning; clearing up in the afternoon; temperature, from +4° to —4°.

March 14.—Wind abates toward morning; clear; clouding up, and light S.E. breeze toward noon; temperature, from —8° to +14°; Joe shot one small seal, and one uktshuk; latitude by ☉, 64° 19′ N.; Joe shot another seal.

March 15.—Moderate W. and N.W. breeze; shifting; clear and fair; temperature, from −5° to +10°; large body of water S.E.

March 16.—Thick and calm toward morning; temperature, −8°, and soon rising to −10°; large bodies of water in all directions; unicorns seen and shot at.

March 17.—Bear-tracks found close to the hut; chase after one early in the morning; thick and light snow; light N.E. breeze in the morning; light S.W. breeze in the evening; temperature, from −5° to +18°.

March 18.—Fair; moderate N.W. breeze; temperature remaining below zero, from −13° to −5°.

March 19.—Fair and moderate N. breeze; temperature, from −18° to −4°.

March 20.—Fair and moderate N. breeze; temperature, from −11° to −4°; Hans shot a small seal.

March 21.—Clear and light N.W. breeze; Joe shot six seals and Hans one.

March 22.—Clear and calm; light N.W. breeze in the afternoon; temperature, from −10° to +15°; Joe shot two seals; latitude 62° 56′.

March 23.—Fair; heavy N. breeze; temperature, from −5° to +8°; Joe shot a seal.

March 24.—Thick and light snow in the morning; fair remainder of day; moderate N. breeze; temperature, from −5° to +8°; Joe shot a seal.

March 25.—Fair; light N. breeze; temperature, from −6° to +7°; Joe and Hans shot a seal each; latitude by ⊙, 61° 59′.

March 26.—Clear; moderate N.W. breeze; temperature, from −4° to +9°; Joe shot four bladder-noses and Hans one.

March 27.—Cloudy; moderate N.W. breeze; temperature, from ±0° to +20°; late in the evening a middle-sized ice-bear found his way to our huts, and was seen first by Captain Tyson, who called Joe; Joe called all hands, who jumped out with pistols and guns in their hands, and soon killed the ice-bear.

March 28.—Thick; moderate northerly breeze; temperature, from +3° to +10°; icebergs collecting around us.

March 29.—Fair; W.N.W. breeze, (moderate;) temperature, from −1° to +9°; water closing in upon us from all sides.

March 30.—Heavy W.N.W. breeze during night; surrounded by water; passing icebergs; small ice passing; wind somewhat abating toward morning; cloudy and changeable; temperature, from +6° to —.

March 31.—Heavy W.N.W. breeze; thick; Joe shot a bladdernose and two young seals; Hans shot one young seal; latitude 59° 41′.

April 1.—Light breeze N.N.W.; left snow encampment, and proceeded to the S.W. in the boat; throw meat overboard; wash-boards to the boat fixed; selection of clothing made; three seals shot.

April 2.—Part of the floe we had pulled up upon the preceding day broke off during night; started 5 a. m.; worked oars; heavy breeze from the S.W. springing up; pulled up upon a piece of ice; boat stove; mended with uktshuk skin; shot one seal.

April 3.—Started at 8.45 a. m.; head wind; used oars until the wind veered to the N.N.W., when the sail was set; hauled out at 2.30 p. m.; pack close; stops our progress; caught a number of seals.

April 4.—Wind N.E., (light breeze;) we opened and we started at 8.45 a. m; 2 hours' run, when we closed, and we hauled out; latitude, 56° 47′. Blowing heavy in the evening, (N.N.W.;) heavy swell from the east.

April 5.—Gale from the N.E.; heavy swell; two pieces of our floe

broke off; removed our boat several times; sea washing over the piece; pitched tent at dark, and set watch.

April 6.—Gale from N.W.; heavy swell and sea; another piece of our floe broke off; only a small piece left; standing by the boat ready for a jump.

April 7.—W.N.W. gale; heavy sea and swell; ice broke under the tent while dividing some bread and pemmican for breakfast; no sight for seals; set watch, in two reliefs, of half of our number.

April 8.—Ice broke at midnight, between tent and boat; I was left with the boat; snowing; heavy sea; gale from W.N.W.; N.E. wind outside of the pack.

April 9.—Heavy wind from the N.W.; heavy sea; latitude 55° 51′ N.; sea washing over the piece; standing by the boat; land seen to the westward; 12 o'clock, night, we closed in; pitched tent and turned in by watches.

April 10.—Calm and cloudy; quiet during night, (pash-ice.)

April 11.—Calm and cloudy, (pash-ice;) saw fox, some land-birds, and crows; icebergs passing close to us.

April 12.—Light S.E. breeze; light swell, (pash-ice;) saw seals, but cannot get them; fine weather; latitude 55° 35′ N.

April 13.—Light S.W. breeze; ice opened during the night, and closed again toward morning; slack during the day; saw seals, but cannot get them; latitude 55° 23′ N.

April 14.—Light N. breeze; pash-ice close; saw seals, but cannot get them; latitude 55° 13′ N.

April 15.—Light N. breeze; snowing during the night; ice close; fine weather; latitude 54° 58′ N.

April 16.—Moderate breeze from N.N.W.; ice close; no swell; watch at night, hourly relief; pemmican nearly entirely used up; reduced our allowance of pemmican and bread.

April 17.—Light breeze from W.N.W.; ice close; latitude 54° 27′ N.

April 18.—Light N. breeze; Joe shot a seal in a crack; divided into sixteen shares; land in sight in the morning, bearing S. and S.W.; ice slackening; crows, land birds; ducks seen.

April 19.—Light N.W. breeze; ice slack; thick; breezing up from the W. toward evening; swell; evening sea washes out of the tent; standing by the boat during entire night; sea washing over us; ice pelting out our feet.

April 20.—Launched the boat at 7 a. m., and arrived safely on a small piece of ice; went after seal in the boat; turned in by reliefs; sleeping in the boat; lost tent.

April 21.—All persons wet through; light N.E. breeze; ice close; latitude 53° 57′.

April 22.—Snow and rain during night; thick in forenoon; ice close; only ten biscuits left to supper for the whole party; shot bear.

April 23.—Light N. and N.E. breezes; raining and cloudy.

April 24.—Light N. and N.E. breezes; raining.

April 25.—N.E. gale during night; raining; heavy swell; launched boat at 5 a. m.; hauled out after eight hours pull; great number of seals seen; some of them shot.

April 26.—Started at 6.30 a. m; pulled up two hours afterward and repaired keel of boat; shot some seal; latitude 53° 30′ N.

April 27.—Snowing in forenoon; clearing up in the afternoon; large body of water making outside of us; cannot get to it.

April 28.—W. gale; heavy sea running; water washing over the floe; standing by the boat during night; snowing during night and forenoon;

launched boat at daylight and proceeded by oar, and also by sail for a short distance; heavy sea and southerly gale blowing; pulled up at 6 a. m.; turned in for a few hours; launched the boat again at 1 p. m.; proceeded by oar; shot some seals; saw steamer; pulled up at dark; night clear.

April 29.—Blubber-fires during night; morning, fine and calm; sighted steamer five miles off; launched the boat at daylight, and proceeded for two hours; encountered close pack; pulled up on piece of ice; set signal and fired shots for steamer; saw land in the morning; latitude 53° 04′ N.

April 30.—Kept fires during night; picked up by Tigress at 5 a. m.

Diary of John Herron.

October 15.—Gale from the S.W.; ship made fast to floe; bergs pressed in and nipped the ship until we thought she was going down; threw provisions overboard, and nineteen souls got on the floe to receive them and haul them up on the ice. A large berg came sailing down, struck the floe, shivered it to pieces, and freed the ship. She was out of sight in five minutes. We were afloat on different pieces of ice. We had two boats. Our men were picked up, myself among them, and landed on the main floe, which we found to be cracked in many places. We remained shivering all night. Saved very little provisions.

October 16.—Morning fine; light breeze from the N.; close to the E. shore. The berg that did so much damage half mile to the N. E. of us. Captain Tyson reports a small island a little to the north of the berg and close to the land. Plenty of open water. We lost no time in launching the boats, getting the provisions in, and pulling around the berg, when we saw the Polaris. She had steam up, and succeeded in getting a harbor. She got under the lee of an island, and came down with sails set—jib, foresail, mainsail, and staysail. She must have seen us, as the island was four or five miles off. We expected her to save us, as there was plenty of open water, beset with ice, which I think she could have gotten through. In the evening we started with the boats for shore. Had we reached it we could have walked on board in one hour, but the ice set in so fast when near the shore that we could not pull through it. We had a narrow escape in jumping from piece to piece, with the painter in hand, until we reached the floe. We dragged the boat two or three hundred yards, to a high place, where we thought she would be secure until morning, and made for our provisions, which were on a distant part of the floe. We were too much worn out with hunger and fatigue to bring her along to-night, and it is nearly dark. We cannot see our other boat or our provisions. The snow-drift has covered our late tracks.

October 17.—Strong wind from the S.E. The ice broke up again. Our boat and everything we have left are going. We are afloat on a very small piece, with very little provisions left. It is blowing a gale, and threatens to be a very severe night.

October 18.—Light breeze from the S.W. Plenty of open water. Joe caught a seal.

October 19.—Wind the same. Joe caught two more seals.

October 20.—This morning thick snow-storm. All are well.

October 21.—Light wind from S.E. Building snow-houses; finished one; we sleep in it to-night.

October 22.—Weather very thick; snow falling. Building snow-houses for the Esquimaux, and one more for ourselves, as the first is too small.

October 23.—Wind light and S.E. With the aid of our marine-glass, to our great joy we discovered in the distance a boat, and, at some distance therefrom, the tent. The ice for a few miles between us and the floe which they are on is very thin, but we must risk it, as we have six bags of bread there, forty-five pound-cans of pemmican, and two dozen cans of meat. Returned to headquarters weak, but thankful to God. Rejoicing in our good fortune, we treated ourselves to a good supper, thanking God for our increase of stores. We have now eleven bags of bread, thirteen cans of pemmican, eleven dozen cans (pint and quart) of meats, soups, with some green corn, and fourteen hams. My bag of clothing I found in the boat.

October 24.—Weather thick and cold. Four men made another trip to the tent to bring some planks with which to make a sleigh. All are in good health.

October 25.—This morning thick, with light wind. Half of the men have gone to the tent with the sled made this morning, drawn by the dogs. The rest of us are remaining here by the boat ready to shove off in case the ice should open. Evening the men returned with a sled-load of poles. All well.

October 26.—This morning clear, with a light breeze. Another journey to the tent brought off the remainder of the lumber, and some canvas. Found two more dogs. There is one more load left on the floe. The remainder of the men staid by the boat as before. All well.

October 27.—Clear, with light wind. We have brought the remainder of our tent and two bags of coal off; that is all we can find. Three men have been out in another direction, but have found nothing.

October 28.—This morning clear; strong wind; very cold. Tried to make a cooking-stove; wind too strong and too cold.

October 29.—This morning very cold and stormy, but clear. The land in sight all the time. We have got our cook-house at work. All well.

October 30.—This morning clear; light wind. The Esquimaux went hunting, but caught nothing.

October 31.—This morning cold, but fine. Sent Joe and Hans with a dog-team to see how the ice will stand, as we intend starting to-morrow for shore. If the ice stand good we shall be there in two or three days. We have eaten as much as we could to-day to get strength for the journey. We have been living very poorly so as to make our provisions last six months. If we can reach the shore we can live better, as we may kill some game.

November 1.—Started to-day for the large floe four miles distant, and one-third of the distance, I should say, to the shore. After a hard day's work we succeeded in getting two boats and our provisions off, also one sleigh-load of bed-covering, skins, and canvas, and some poles; leaving three bags of coals, the only ones we had left. We left a great many poles, some canvas, two kyacks, and other things; among them two boxes of clothing belonging to Joe, tools, and other very useful articles, which are a great loss to us.

November 2.—This morning we were surprised to find the ice open and water all around us. We started before daylight with the dogs and sled, not knowing what had happened until we had nearly driven into the water. There was no wind, so all the mischief was done by the

high tide at night. The ice closed in a little. We tried again, leaving the dogs and sled on the E. side of the floe, and ventured across on the other floe. We saved one rake, some of Joe's clothing, three guns, and a few other things. When the men returned to the crack it was opening. They got across just in time, as the ice opened and the floe has not since been seen.

November 3.—This morning snow-storm. Building snow-houses. All well. No chance now of getting ashore; must now give that up.

November 4.—Snow-storm. Still building snow-houses.

November 5.—Blowing a gale from N.W. Snow drifting. The men cannot leave the hut, the weather is so severe.

November 6.—Captain Tyson ill with a severe cold, and pains all over him. The weather mild; light wind. Joe caught a seal, which has been a godsend. We are having a feast to-night, three-fourths of a pound of food being our allowance. Mr. Meyer made a pack of cards from some thick paper, and we are now playing euchre. Plenty of water around us. We are a good deal further from the land, and are drifting south pretty smart.

November 7.—Captain Tyson better. Wind strong, snow drifting, weather thick.

November 8.—Weather very bad. We cannot leave the hut.

November 9.—Weather the same; very severe. We are prisoners in the hut.

November 10.—Wind strong; snow drifting. We are drifting fast to the south. The west land is not to be seen. The Esquimaux are out hunting. Joe has returned late; Hans has not come yet. Joe and Robert have gone in search of him. He had left the floe for another one, and with great difficulty found his way back very late. They saw him coming, dressed in skins and covered with snow, and took him for an ice-bear; loaded their pistols and made ready, when, to their joy, they found it was Hans.

Monday, November 11.—Wind strong; snowed in, and drifting fast.

Tuesday, November 12.—Rather strong breeze; snow drifting a little. Took exercise to-day. Water around us; drifting south fast.

Wednesday, November 13.—Light wind; snow falling; very mild. Building a snow-house for a reserve—a very large one. Peter sick.

Thursday, November 14.—Cloudy; light wind. Building and exercising. All well.

Friday, November 15.—Spring tide; water all around the floe; light wind. The last two nights have been splendid; clear and moonlight.

Saturday, November 16.—Calm, but thick. Joe saw three seals yesterday, and a fox-track, but got nothing. We have nothing to feed our dogs on; they got at the provisions to-day; we shot five, leaving four; shot some two weeks since. Lining our new hut with canvas.

Sunday, November 17.—Strong N.W. wind; snow drifting; very cold; cannot leave the hut.

Monday, November 18.—Everything the same as yesterday; cannot leave the hut.

Tuesday, November 19.—Cold and clear; stiff breeze from the N.E. Four hours of twilight yet. We must be going south fast. The Esquimaux fell in with two bear-tracks and five seal-holes; I wish we could kill some of them; we are pretty well starved. Peter fell through the ice with the rake to-day. All well.

Wednesday, November 20.—This is the finest day we have had for some time; very light breeze; cold; very clear.

Thursday, November 21.—Light wind; clear. The natives caught two

seals; they shot three, but lost one of them in the young ice. We moved into our new house to-day. We shot two dogs—they got at our provisions; we have two left.

Friday, November 22.—Fine; very light wind N. Joe caught one seal; another good supper we had.

Saturday, November 23.—Light wind N.E. Hans caught a seal; we are living high just now.

Sunday, November 24.—Light wind N. No water to be seen to-day.

Monday, November 25.—Light wind from W.N.W.; there is no open water to be seen. We have seen the fox, whose tracks we have observed so long.

Tuesday, November 26.—Strong wind W.N.W.; thick and cloudy; cannot take exercise. All well.

Wednesday, November 27.—Strong wind W.; snow drifting; thick and cloudy; cannot take exercise. To-morrow is Thanksgiving; we must fix up something extra. All well.

Thursday, November 28.—Strong wind; thick and cloudy. Thanksgiving to-day; we have had a feast—four pint-cans of mock-turtle soup, six pint-cans of green corn, made into scouch. Afternoon: three ounces of bread and the last of our chocolate; our day's feast. All well.

Friday, November 29.—Light wind, thick, and cloudy. We cannot hunt for want of light; cannot shoot by moonlight.

Saturday, November 30.—Calm; thick and cold. Saw a seal, but could not see to fire; there is very little light; some days when it is thick there is not any. All well.

Sunday, December 1.—Calm, but little light. This month out and we can hope for the best, as daylight will begin to come upon us. Fred saw the bear to-day, but being alone dared not go for him.

Monday, December 2.—Strong wind; cloudy. No open water has been seen for several days; cannot catch anything. Land has been seen for several days; cannot determine what shore it is, E. or W. It has been so cloudy that we cannot select a star to go by; some think it is the E. land; for my part, I think it is the W. Boiled some seal-skin to-day and ate it—blubber, hair, and tough skin. The men ate it; I could not. The hair is too thick, and we have no means of getting it off.

Tuesday, December 3.—Clear and calm. We are nearing the land a little. All well.

Wednesday, December 4.—Light wind, cold and thick. No water to be seen. I am sorry to say Hans has had for several days a bad diarrhœa.

Thursday, December 5.—Light wind; a little thick; 15° below zero. The fox came too near to-day; Bill Lindemann shot him; skinned and cut him up for cooking. Fox in this country is all hair and tail.

Friday, December 6.—Very light wind; cold and clear. The poor fox was devoured to-day by seven of the men, who liked it; they had a mouthful each for their share; I did not think it worth while myself to commence with so small an allowance, so I did not try Mr. Fox. Last night fine northern lights. Hans better.

Saturday, December 7.—Light wind from S.W.; nothing to be seen; no water. Mr. Meyer took a lunar observation last night and found our latitude to be 74° 4′, longitude 67° 53′. The ship's winter-quarters were latitude 77° 35′, so that we have drifted 3° and 31′ in less than two months. If we keep on in this way we will be off the island of Disco in March. All in good health. The only thing that troubles us is hunger; that is very severe. We feel sometimes as though we could eat each other. Very weak, but please God we will weather it all.

Sunday, December 8.—Good twilight for two hours; clear; light wind, S.S.W.

Monday, December 9.—Clear; wind light, W.; 18° below zero. Ice grinding. No open water to be seen.

Tuesday, December 10.—Good twilight to-day. We must have drifted to the E.; 22° below zero. Light wind N.W. All well.

Wednesday, December 11.—Light wind; 26° below zero. We have made considerable easting.

Thursday, December 12.—Light wind; 22° below zero.

Friday, December 13.—Light wind; cloudy; 19° below zero. Hans caught a small white fox in a trap yesterday. The nights are brilliant, cold, and clear. The scene is charming, if we were only in a position to appreciate it.

Saturday, December 14.—Calm, clear, and quiet. No ice moving; 26° below zero. All well.

Sunday, December 15.—Light wind S.W.; cloudy; 20° below zero.

Monday, December 16.—Calm and cloudy; 13° below zero. No water to be seen. All well.

Tuesday, December 17.—Light wind from W.; cloudy; 4° below zero. Last night the wind sprang up. The moon looked sickly, and we expected a gale. Later on the wind dropped. It cleared up, the moon shone out, and it became a splendid night.

Wednesday, December 18.—Light wind; clear. All well.

Thursday, December 19.—Cold; very strong wind W. Snow drifting. Cloudy.

Friday, December 20.—Light wind; cloudy. Joe found a crack yesterday, and three seals. Too dark to shoot. It is a good thing to have game underneath us. It would be much better to have them on the floe, for starving men. To-morrow will be our choicest day—then the sun returns.

Saturday, December 21.—To-day clear; light wind. The shortest day, so cheer up! In three weeks we will have daylight. Then we hope to catch game.

Sunday, December 22.—Calm and clear as a bell; the best twilight we have seen for a month. It must have been cloudy, or we are drifting S. fast. Our spirits are up, but the body weak; 15° below zero.

Monday, December 23.—Light wind; clear. Good twilight for two hours. All well.

Tuesday, December 24.—Blowing pretty hard. Part of last night cloudy, and a light breeze. Last night and night before splendid display of northern light; very brilliant. Christmas-eve. We are longing for to-morrow, when we shall have quite a feast—half pound of raw ham, which we have been saving nearly a month for Christmas. A month ago our ham gave out, so we saved this for the feast. Yesterday, 9° below zero; to-day, 4° above zero.

Wednesday, December 25.—This is a day of jubilee at home, and certainly here for us; for, beside the approaching daylight, which we feel thankful to God for sparing us to see, we had quite a feast to-day. One ounce of bread extra per man, which made our soup for breakfast a little thicker than for dinner. We had soup made from a pound of seal-blood, which we had saved for a month; a two-pound can of sausage-meat, the last of the canned meat; a few ounces of seal, which we saved with the blood, all cut up fine; last of our can of apples, which we saved also for Christmas. The whole was boiled to a thick soup, which, I think, was the sweetest meat I ever ate. Half pound of

ham and two ounces of bread gave us our Christmas dinner. Then in the evening we had our usual thin soup. So ended Christmas-day.

Thursday, December 26.—Last night it blew a gale from the N. We were snowed in this morning, the snow drifting so badly. It is blowing very severely yet. Yesterday, 3° below zero; this morning, 12° above. All well and pretty happy.

Friday, December 27.—The wind moderated last night. Very cloudy to-day.

Saturday, December 28.—Very thick and cloudy. Hans shot a sea to-day, but could not get it.

Sunday, December 29.—Light breeze; cloudy. Joe shot a seal, which is a godsend, as we are pretty weak. It is breezing up strong. We have had a good supper; thank God.

Monday, December 30.—Blowing a gale from N.W. Thick and snow drifting; 10° below zero. Evening, the wind has shifted around; it is quite calm.

Tuesday, December 31.—Very light breeze from the S.; cloudy. The light is increasing; 23° below zero.

Wednesday, January 1, 1873.—Cloudy; no water; 29° below zero. Poor dinner for New-Year's Day—moldy bread and short allowance.

Thursday, January 2.—Twenty-three degrees below zero; thick; light wind; no water.

Friday, January 3.—Twenty-three degrees below zero; very cloudy; strong wind; cannot leave the hut.

Saturday, January 4.—Twenty-five degrees below zero; wind the same; cannot leave the hut.

Sunday, January 5.—Cold and clear; 26° below zero; six hours' good light, but no water. To-day fell in with two bear-tracks, but cannot find them. If we could kill one of those fellows it would set us all right.

Monday, January 6.—Calm and clear; 25° below zero; wood finished, but it is little for the boat-journey. (?)

Tuesday, January 7.—Mr. Meyer took an observation last night; latitude, 72° 7′; longitude, 60° 40′ 45″. The news was so good that I treated myself to an extra pipe of tobacco at 12 o'clock last night. The tobacco is getting very short, so that I have to be very saving this month. We are obliged to cook our meals with a lamp—pretty slow work. Light wind; 31° below zero. Good northern lights last night.

Wednesday, January 8.—Light wind; 29° below zero. No water yet. Hans's little boy has been very poorly for some time back. I hope he will get better soon.

Thursday, January 9.—Calm and clear; 38° below zero. All well.

Friday, January 10.—Light wind, S.E.; clear; good light; cold; 34° below zero.

Saturday, January 11.—Light wind, N.E.; 34° below zero. No water.

Sunday, January 12.—Wind N.W.; 33° below zero. All well.

Monday, January 13.—Light wind; 39° below zero. Too cold to do anything. No water, nor are we likely to have any. All well.

Tuesday, January 14.—Light wind; cloudy; thick and cold. Yesterday it ranged from 39° to below 40°. The mercury froze. It was over 40° below zero. To-day it stands from 13° to 16° below zero. This evening the wind increased and the snow is drifting.

Wednesday, January 15.—Blowing a gale. Snow drifting very badly. Our dogs (we have two yet) had an encounter with two bears. One of the dogs got cut when some distance from the floe.

Thursday, January 16.—No wind; very thick. The glass ranges from 26° to 31° below zero. Hans caught a seal to-day; thank God! for we were very weak. Our light would have been finished to-morrow, and our cooking also. But God sent this seal to save us; thanks to His holy name! It has been so all the time. Just as we were played out something came along. I am afraid I have a touch of the scurvy. A little raw meat will drive it out, I hope. Hans's boy is no better. I hope it will do him good also.

Friday, January 17.—Strong wind, N.W.; very thick; snow drifting; 35° below zero.

Saturday, January 18.—Twenty-nine degrees below zero; strong wind; very cloudy; snow drifting.

Sunday, January 19.—Clear; light wind; 39° below zero. The sun has made his appearance to-day. I gave him three cheers, hoping we will be able to start a month from now. Thank God for this day! we have long wished to see it. The sun has brought us luck in the way of a seal Joe caught. The finest display of northern lights that I ever saw came off to-night. They had to go about six miles to-day to open water, where they saw many seals.

Monday, January 20.—Light wind N.; very cloudy and thick; 34° below zero. The sun has not made his appearance to-day. Mr. Meyer took an observation last night. We are in latitude 70° 1′ N., and 42 miles from the E. shore. We have not seen the E. shore yet. I hope to see the island of Disco; the land is very high there, but I am afraid we will drift past it. We cannot help ourselves, however. We are in the hands of God, and I am thankful. Hans shot a dovekie. I hope he will give it to his boy.

Tuesday, January 21.—Light wind; the sun is out; 36° below zero. The Esquimaux chased two bears, but could not get near enough to fire.

Wednesday, January 22.—Calm and clear; 40° below zero; very light breeze N.W; rather cloudy. Joe caught a seal, very small and tender; caught it at a blow-hole.

Friday, January 24.—Light breeze S.; very thick; 25° below zero. A seal was caught to-day by Hans in a blow-hole. This will get our strength up, thank God!

Saturday, January 25.—Calm, clear, and very cold; 40° below zero, I cannot tell how much more below; the mercury is frozen. One dog lost; one remaining.

Sunday, January 26.—Very light wind N.W.; 40° below zero; the mercury is frozen. Joe caught a seal in a blow-hole to-day. This will get our strength up, as we barely lived on the scoush. All well.

Monday, January 27.—Calm; very cold; mercury frozen; thick this morning; clearing up now. The sun is out. Mr. Meyer took an altitude of the sun to-day, and an observation from a star last night. He makes it latitude 69° 32′. Godhavn, in the island of Disco, is in 69° 13′; that leaves us 19 miles N. of our store-house, which I am afraid we will never see. God knows where we will fetch up. Mr. Meyer thinks we are 42 miles from the E. shore, but I am afraid he does not know much about it.

Tuesday, January 25.—Clear, cold, calm; sun shining; the mercury below 45°, and frozen in the glass, so that we cannot tell how cold it is. The northern lights appear almost nightly; sometimes very brilliantly. All well.

Wednesday, January 29.—Calm, cold, thick. The thermometer ranges from 36° to below 40°, and the mercury is frozen. No water. No land in sight.

Thursday, January 30.—Calm and clear. Temperature from 23° to 35° below zero.

Friday, January 31.—Strong wind last night. The wind is trying hard to haul around to the S. I expect a gale from there soon. I hope so, for it will bring us open water; and I hope for a rise of temperature. It has risen to-day from 24° to 19° below zero.

Saturday, February 1.—Blowing a gale, W. N.W.; thick; snow drifting.

Sunday, February 2.—Blowing in squalls; thick. Yesterday, 24° to 19° below zero. To-day it is 19° to 16° below zero.

Monday, February 3.—Light wind S. S.W.; it has died out this evening. Temperature from 26° to 12° below zero. No water.

Tuesday, February 4.—A gale from the W.; very thick snow-drift. I seldom see it snow here, for when it is blowing hard the snow comes like flour with the wind. Whether the snow falls or the wind takes it up from the ice I cannot tell, but it is so fine and thick you cannot see. There is no leaving the hut in such weather, as the snow is always either drifting or falling with the blow, no matter from what quarter. Then there is no going out, as it fills the ice and will penetrate almost anything. The temperature to-day has been from 16° to 10° below zero. All are well, thank God, but me. I have a slight touch of the scurvy, and feel very ailing, but, please God, it will soon leave me. We hope when this blow is over we shall see the land and have a little open water.

Wednesday, February 5.—Calm and clear. A few cracks of water. Hans caught a small seal to-day. Joe shot one, but could not get it. Temperature from 26° to 17° below zero.

Thursday, February 6.—Stiff breeze last night and to-day. Snow drifting. Temperature, 11° to 5° below zero. This evening blowing a gale S.W. I hope to have some water after it and to sight the land.

Friday, February 7.—My gale of wind lasted but a short time. Last night it was blowing a gale S., and we got the tail-end of it; to-day thick, with a stiff breeze from the N. Hans caught a seal and fired at a narwhale. Joe shot and killed a big fellow, but we could not get him; he turned belly up and sank. He would have been food for a month. There were a great many of them going N.; it is their time of year. Temperature from 26° to 21° below zero.

Saturday, February 8.—Wind S.E. A pretty large crack around the floe. Shot five unicorns to-day, but we could not get them, as they got away under the ice. Seven have been shot altogether. Joe said a large fleet of them were going north, but they could not find water, so they came back again. We cannot find any seals when they are about. Joe says they are not afraid of the whale, but it appears to me they are, for while the whales are here they will not make their appearance. Temperature, 21° to 16° below zero.

Sunday, February 9.—Last night it was blowing a smart gale from the S.E. Snow drifting, very thick. Late this afternoon the wind veered N., blew light, and cleared up a little. The Esquimaux went out to find water. They found the crack open and full of unicorns, but it was too thick to shoot. We were completely snowed in this morning, and with difficulty freed ourselves. Temperature, 15° to 10° below zero.

Monday, February 10.—Stiff breeze, N.E.; thick snow, drifting, and has been all night. No water could be seen this morning, but later the crack opened, and Joe caught two seals. Hans shot a narwhale. I am afraid we shall not be lucky enough to catch one. I hope we may. Mr.

Meyer has the diarrhea badly. Robert Kruger has also been ill with it, but he is getting better. The temperature to-day has been from 14° to 10° below zero.

Tuesday, February 11.—Very stormy to-day; thick, and snow drifting; cannot go out; increasing to a gale. Temperature, 15° to 7° below zero.

Wednesday, February 12.—Last night and to-day blowing a gale from N.W.; it is now blowing lightly, and I think will calm down to-night. Temperature, 14° to 11° below zero. All well, thank God.

Thursday, February 13.—Blowing very strongly; wind W.N.W. Temperature from 22° to 17° below zero. No water to-day, but young ice. Joe saw plenty of narwhales; they came up and blew like the seal. The ice is so young that it will not bear; if it remains Joe thinks he may catch one in the holes; I hope he may. Have been repairing our house to-day. All well.

Friday, February 14.—Very strong wind; thick, and snow drifting. We are having a long spell of bad weather. Hans caught a seal to-day, which will give us another meal. Saw a fox to-day near the huts, but not near enough to get a shot at him. Joe hit three unicorns to-day, but I am afraid our chance to get one is small; I hope, however, I may be disappointed; 16° below zero.

Saturday, February 15.—Very stormy; snow drifting, and as bad as ever. Water around at some distance. Have been repairing the hut this last week. All well. Temperature, 15° below zero. Saw some seals and whales, but could not get either.

Sunday, February 16.—Wind W.S.W.; 16° below zero. Saw plenty of whales; wish they would take their departure; they frighten the seals away, which we are now so badly in want of; our provisions are getting very low. When you take a glass and look around, you see the ice in the distance piled up as high as a ship's mast, so that it seems impossible to travel over it—certainly not with a boat—and no land to be seen yet. We want water to escape, and, please God, we will get it when the time comes. All well.

Monday, February 17.—Light breeze; very cold; 20° to 30° below zero; it is that every night, but runs up every day. Hans caught a seal to-day—a very small one.

Tuesday, February 18.—Blowing a gale from W.N.W.; snow-drift; cannot get out; 24° below zero.

Wednesday, February 19.—The welcome cry this morning was "Land ho!" to westward, Cape Walsingham. Now we will be out of the narrows. The straits commence to widen here so that we can travel S. fast if we cannot reach land. Joe caught a small seal to-day; 23° to 15° below zero. All well.

Thursday, February 20.—Calm and very thick. Water around; cannot see land. The seals are very scarce here. I hope we will soon strike better ground. We must soon get a good lead of water running in-shore, and so escape, or kill plenty of seals to live on, else our time in this world will be short. But God's will be done. Shot some small birds yesterday and to-day, called dovekies. Temperature 11° to 4° below zero.

Friday, February 21.—Snow falling last night. Calm to-day, thick, and land, I should say, ten miles nearer than it was the other day. From 6° to 9° below zero.

Saturday, February 22.—Calm; very thick—bad to see land. No game to be seen yet, except dovekies, and a very few of them. Bill fell through the ice trying to get one. He had to swim for it, but got it out

all right. We are preparing for a start in-shore. We will be ready soon, I hope. We may get a chance then, and not drift off. I think the land is distant thirty miles. Temperature, 5° to 24° above zero. It is getting windy to-night. I think it is blowing a gale from the S.E., which makes it so warm. All well.

Sunday, February 23.—Very thick; blowing strongly from the N.W. Bill fell through the ice, and was some time in the water. The temperature was above zero; so he did not freeze.

Monday, February 24.—Very light wind; thick; below zero. Can see the land, but cannot start. Such a quantity of light snow has fallen, and you sink into it so, that it would be impossible to get the boat through it. Land is twenty miles off, I should say, and we appear to be leaving it. My advice is to start for it—making a sleigh out of some spare skins, loading it with provisions and clothing, and the kyak to ferry us across the cracks; also, ammunition for hunting purposes when we get on shore. By that means we could leave the boat and travel light, for it is my opinion that we will never get the boat over the ice any distance. We seem to have left the sealing-ground. We cannot catch anything to speak of, and we have only three weeks' provisions left. Captain Tyson and some of the men are afraid to venture in-shore, and unwilling to leave the boat; so we have made up our minds to stay, come down in our provisions, and trust in God, hoping we may drift on a better sealing-ground, and thus live through it. I asked the Esquimaux's opinion about it—what they would do if they had not us to influence them. They told me they would start for land directly they saw it. They do not like to speak their minds openly for fear something might happen—meaning they would be blamed for it; so they are silent, following only the advice and opinions of others. Joe is very much to be praised, also his wife Hannah. We may thank them and God for our lives and the good health we are in. We could never have gotten through this far without them. If we ever get out of this difficulty, they can never be paid too much. Joe caught a very small seal, which makes the eighth this month. Northern lights very brilliant to-night. All well.

Tuesday, February 25.—Calm and clear. Land in sight, but not so near, I think, as yesterday. We are drifting S. fast. I hope we may strike a better sealing-ground soon, for in that lies our salvation. My trust is in God. Temperature 8° below zero and 10° above. A little snow falling. No open water. Some seal-holes are seen.

Wednesday, February 26.—Very light breeze N. Twenty-four degrees below zero, but rising slowly as the sun comes out. A crack of water to the E. Land to be seen. We are coming down on our provisions one-half; that is as low as we can come, and keep life, and will be a few ounces a day.

Thursday, February 27.—Strong wind N.W. Land in sight. A little cloudy. Temperature 25° below zero.

Friday, February 28.—Wind the same. Followed up a bear-track, but at a crack lost it, where he broke through the young ice and swam across. Shot a meal of dovekies to-day, which we will have for breakfast to-morrow morning, please God. We have been saving them for a few days, so that we have nearly enough for a second meal. We are allowed two dovekies per man. Boiled with a pot of soup, it will save our provisions a little. Bill fell through the young ice, and had a swim for it, a few days ago. The temperature was above zero, so he did not get frozen, but he cannot get his clothes dry. Twenty-eight to twenty-three degrees below zero. Saw some seals to-day, but could not get them.

Saturday, March 1.—Very little wind, N.W. No water to be seen yet;

may open during the day. Thirty-four to twenty-five degrees below zero. We are drifting S. fast; can just see the mountains in the N.W. Sometimes Peter favors us with a sailor's yarn when we lie down at night; that is, when we have had a meal of seal-meat. All other nights we are quiet enough. Caught sixty-five dovekies to-day; good luck. It takes thirty-three for a meal. Joe fired, and hit some unicorns, but ball, it seems, will not kill them. All well.

Sunday, March 2.—Light wind, N.E.; 31° to 23° below zero. Splendid display of northern lights these last two nights. To-day God has sent us food in abundance. Joe shot an oogjook, one of the largest kind; plenty of meat and oil; and forty-two dovekies. It took all hands to drag him home. That was a good Sunday's work; dragging the fine fellow to the hut, and thanking God for His mercies. Begins to breeze up, and the snow drifts pretty lively. All well and happy.

Monday, March 3.—Thick; snow drifting, and strong wind from the N.E. Weather not fit for the natives to go out. We can afford to have one or two days' rest without fear of starving. Temperature, 25° to 21° below zero.

Tuesday, March 4.—Calm, clear, and cold; 31° to 6° below zero. The sun gets on the glass in the day-time and makes it run up so high. Caught four dovekies. Very little water; only a small crack.

Wednesday, March 5.—Blowing a gale from the N.W. Snow drifting; cannot get out. Joe went out in the last blow; it seems to me he cannot stay in; he is a first-rate fellow; we would have been dead men long since had it not been for him; 30° to 18° below zero. All well.

Thursday, March 6.—The gale as fresh as ever; snowed in yet; very cold. Every man complaining of headache from the oogjook liver. I am very sick with violent headache; 24° below zero.

Friday, March 7.—The gale abated this morning. Stiff breeze yet, and snow drifting. Immense icebergs all around the floe. There was a fearful noise all last night, which kept us awake. The floe was cracking, splitting, and working in the most fearful manner, just like a park of artillery and musketry. I expected to see it split into a thousand pieces every moment. I feel very bad yet in my head and stomach. The liver of bear and oogjook, they say, is very dangerous to eat. But what is a hungry man to do? We have eaten the seals—hair, skin, and everything about them—and are glad to get them; 12° below zero. Joe caught two dovekies. Weather getting bad.

Saturday, March 8.—Calm and clear; 30° to 12° below zero. No water, nor anything to be seen. All well.

Sunday, March 9.—Calm; thick; very little water, some distance off. Splendid display of northern lights last night; 24° to 11° below zero. Strong breeze springing up from N.W. Joe caught a very small seal; the smallest yet. There is a great difference between the seal shot last Sunday and this; the one to-day a handful; that of last Sunday some hundreds of pounds. I feel very bad from the liver yet; the skin is peeling from my face.

Monday, March 10.—Blowing a gale from the N. Snow drifting. Cannot tell E. or W., for it is so thick we cannot see ten paces ahead. 16° to 5° below zero.

Tuesday, March 11.—Blowing a strong gale yet. All hands were up last night and dressed, ready for a jump, for the ice was splitting, cracking, and making a fearful noise all night. To-day has been a fearful day—cannot see, for snow-drift. We know the floe is broken into small pieces. We are afloat—jumping and kicking about. This is not very pleasant. My hope is in God. 6° above zero.

Wednesday, March 12.—Last night was a fearful night of suspense—ice creaking and breaking; the gale roaring, and the water swashing. But where? We know it is around us, but cannot see anything. Since one o'clock this morning the wind has been going down, thank God, and now I can see around. A nice picture! Everything broken up into small pieces; the best piece we are on. The houses are nearly covered. Afternoon: It has calmed down to a fine day, with a light breeze. Joe caught two seals, and Hans caught one. Captain Tyson also caught one. Joe caught three dovkies, and the cook two—showing how good God is to us. From 6° to 10° below zero.

Thursday, March 13.—Very strong wind; almost a gale, N.N.W. Cloudy. No snow-drift. Cannot hunt to-day; we dare not leave the piece of ice the huts are on Temperature, a round zero. Mr. Meyer got an altitude yesterday; latitude 64° 52′ N. All well.

Friday, March 14.—Wind blowing strongly all night. Northern lights very fine. This morning the sun is shining very clear and bright. Joe shot another uktshuk, not quite so large as the last. She has a young one inside, hardly as big as a seal. Now, thank God, we can feed up, for I do not think we will hunger any more. The ice has broken up and good weather is near. Joe caught two more seals. Mr. Meyer took the sun to-day; latitude 64° 19′ N. Temperature, 8° below to 10° above zero.

Saturday, March 15.—Wind W.N.W., very strong. Clear. 5° below to 10° above zero. Yesterday wind E.S.E. All well.

Sunday, March 16.—Light wind N. Clear. Two seals were seen, but could not get anything. Fired five shots at a unicorn. I think we wounded him, but he got away. 6° below to 2° above zero. All well.

Monday, March 17.—Saw a bear this morning, and gave chase, before 6 o'clock. After a very exciting run of over two hours, he got over a large space of water, and we had to give him up. Saw a whale and three seals, but got nothing. Mr. Myer took an altitude; latitude 63° 43′ N. Thick and hazy; a little snow falling. Wind this morning N.E.; this evening S.E. Temperature, 5° below to 16° above zero.

Tuesday, March 18.—Splendid display of northern lights last night; 12° below zero; strong breeze W.N.W. Plenty of whales; nothing else to be seen. All well.

Wednesday, March 19.—Strong wind N.W.; nothing to be seen yet in the shape of game. I think we must be drifting off the grounds again; I hope we will soon get on another; 17° below to 5° above zero; ice grinding very much; I think we must be drifting S. very fast.

Thursday, March 20.—Blowing; strong wind N.N.W.; cannot leave the huts; this makes the third day of confinement; 14° to 4° below zero. Northern lights can be seen every night, or nearly so; they are so common, I do not think I will mention them again.

Friday, March 21.—Wind light, N.; saw a large bear-track; followed it, but could not come up with him. Water two miles off; carried the kyak there. Hans caught one seal yesterday and one to-day; Joe caught two seals to-day; 10° to 8° below zero. Joe caught four more seals, making six to-day. The last day of winter.

Saturday, March 22.—Splendid day; very light wind W.N.W. The first day of spring; thank God we have lived to see it. The sun shines very powerfully—at least, I think so. 10° to 12 below zero. Joe caught two seals to day.

Sunday, March 23.—Mr. Meyer took an observation yesterday; latitude 62° 52′ N. Very strong wind N. Cannot leave the huts to-day. It is dangerous to go far. 5° below, 7° above zero.

Monday, March 24.—Wind light, N. Joe caught a seal. 4° below to 6° above zero. All well.

Tuesday, March 25.—Wind light, N. Water three miles off and very little of it. Joe caught a seal and Hans one, also. Mr. Meyer took an observation; latitude 61° 59′ N.; going south fast. Breezing up. 6° below to 7° above zero. Spring-tide on Saturday, 29th; expect to go S. fast then.

Wednesday, March 26.—Lively breeze N.W.; water three miles off. Joe caught four seals to-day and Hans one—the first of the kind; they call them bladder-nose; they are buggers to fight. I do not know how far S. we shall have them; we have just struck their ground. They are splendid seal—much larger than the others. It is very dangerous going out so far; the ice is so weak, and then it is so near spring-tide. It is very dangerous, but we must risk something for a living. Thank God we can get so much for the risk. All well. 4° below, 9° above zero.

Thursday, March 27.—Nice breeze N.W.; zero and 20° above. Went out to-day to the old place, but was forced to come back. Esquimaux and all pretty lively. It is so dangerous we will have to wait until after spring-tide; we can afford it, having over one week's provisions in store. Fred. got a very bad cut to-day in the thigh; it was an accident, and very deep, but in a good fleshy part. A very agreeable surprise to-night, while at supper. A bear came to the hut. Of course, he died; we buried him in the snow until morning.

Friday, March 28.—Wind very strong N.W. Cloudy and snowing. Cleared up at noon for a short time, but got very thick again. Zero and 10° above. Skinned and cut up the bear; he is a fine young one, very tender and fat, weighing, I should say, 700 or 800 pounds. We are making some sausages from him, which are very good, I think. I think it is the sweetest and tenderest meat I ever ate. The fat cuts like gelatine.

Saturday, March 29.—Has been blowing very hard since last night, and is doing so yet. Very cloudy. Surrounded with large bergs; the ice broken up; water all around. Never saw so many icebergs; we are completely hemmed in by them. Do not know what distance we are from land. Nothing to be seen but the old sight—icebergs, floes, and water. Wind W.N.W.; 1° below, 9° above zero. Breeze freshening into a gale. All well.

Sunday, March 30.—Blowing a gale from W.N.W.; it looks fearful. Last night the sight was dreadful. I went out, and there, within 10 or 12 yards of the door of our hut, was a very large and ugly-looking iceberg grinding against us. Our little floe gets smaller in open water. To-day we had the pleasure of launching the boat. We saw on a piece of ice a large seal; we fired and thought we hit him. When we had pulled there with the boat, we found a large bladder-nose and her pup. She showed fight, but was soon killed, and, with her pup, towed to our floe. The buck was shot, but got under the young ice. When opened, we found considerable milk in her; so we can have some good soup to-night, using the milk and two quarts of blood. We made some good sausages from the bear. This bear was more tender than the one we caught in Polaris Bay. 6° to 8° above zero. Hans shot another calf.

Monday, March 31.—Strong wind W.N.W. Thick. Looks like clearing up. A seal and two calves killed by Joe; one calf by Hans. Mr. Meyer got an observation—59° 41′ N. That makes 23 miles per day that we have drifted the last five days, besides what eddying we have made, with this W. wind. These seals have all been caught on the ice which drifted by us. Our piece of ice gets much smaller. Open water.

Sometimes we get separated from the ice, and it looks like the ocean which we have on one side of us; the E. side. We are nearly off Cape Farewell. Last night, ran a very heavy sea; not a bit of ice to be seen as far as the eye could reach. To day closed around a little, but plenty of water. Dare not venture in our open boat; we must watch and wait and trust in God. 7° to 12° above zero. Caught three more calves and one more seal. Heavy weather setting in; the floe wearing away rapidly. I must hope for the best. All well.

Tuesday, April 1.—Wind N.W. A fearful night, last night. Cannot stay on our floe; must leave it at once. Got under way at 8 a. m.; the boat taking in water. Loaded too deep. Threw overboard 100 pounds of meat; must throw away all our clothes. Cannot carry anything but the tent and a few skins to cover us with, a little meat, and our bread and pemmican. Made 10 to 15 miles S., and 3 or 4 miles W., from 8 a. m. to 12 noon. We landed to lighten our boat; pitched our tent, and intend stopping all night. Caught a young seal as soon as we got on the ice. When we left this morning, 12° above zero. This afternoon spent in making from canvas washboards for the boat, to keep her dry. Caught two more seals. This piece of ice is not very safe; it is cracking. All well. Splendid weather this afternoon.

Wednesday, April 2.—Lovely last night. The floe lost several pieces. I could not sleep for two reasons: the ice breaking up, and too cold. Had to keep in motion to keep warm. Started at 5 a. m.; the weather very fine and calm. Worked the oars for two hours, then a breeze sprung up and increased until it blew almost a gale. We made several narrow escapes with our boat before we could find a piece of ice safe enough to land on, and when we did she was making water fast. When emptied, we found a hole in her side, which we are repairing this afternoon. Weather still very bad. We are in a very bad fix. Caught a seal. All well.

Thursday, April 3.—Repaired our boat, and started at 8.45 a. m.; wind ahead; yesterday S.W.; to-day calm. Pulled three hours, when a breeze sprang up from N.N.W. We kept under way until 2.30 p. m., when we had to haul up on a piece of a floe. We were beset by the ice and could not get through; so we encamped for the night. The wind is now fair for us, N.N.E., but we cannot get through the ice. I hope for better luck to-morrow. We take seal when we want them, old or young, so that it is not necessary to croak any more until they get more scarce.

Friday, April 4.—Wind N.E.; favorable for us, but I am sorry to say we cannot start. The ice surrounds us; the ice opened at 8.30, and we got under way at 8.45 a. m. After two hours' good run we are beset in the ice again, and have to stop for the present, hoping it will open to-morrow. Mr. Myer took an observation; latitude 56° 47′ N. The wind is springing up; I am afraid we shall have bad weather.

Saturday, April 5.—Blowing a gale from the N.E., and a fearful sea running. Two pieces broke from the floe. We are on one close to the tent. At 5 a. m. removed our things to the center. Another piece broke off, carrying Joe's hut with it; luckily it gave some warning, so that they had time to throw out some things before it parted. A dreadful day; cannot do anything to help ourselves. If the ice break up much more we must break up with it; set a watch all night.

Sunday, April 6.—Wind changed to N.W.; blowing a very severe gale. Still on the same ice; cannot get off. At the mercy of the elements. Joe lost another hut to-day. The ice, with a roar, split across the floe, cutting Joe's hut right in two. We have but a small piece left. Can-

not lie down to-night. Put a few things in the boat, and now standing by for a jump; such is the night.

Monday, April 7.—Wind W.N.W.; still blowing a gale, with a fearful sea running. The ice split right across our tent this morning at 6 a. m. While getting a few ounces of bread and pemmican, we lost our breakfast in scrambling out of our tent, and nearly lost our boat, which would have been worse than losing ourselves. We could not catch any seal after the storm set in; so we are obliged to starve for a while, hoping in God it will not be for a long time. The worst of it is, we have no blubber for the lamp, and cannot cook, or melt any water. Everything looks very gloomy. Set a watch; half the men are lying down, the others walking outside the tent.

Tuesday, April 8.—Last night, at 12 o'clock, the ice broke again, right between the tent and the boat, which were close together, so close that a man could not walk between them. There the ice split, separating the boat and tent, carrying away boat, kyak, and Mr. Meyer. There we stood, helpless, looking at each other. It was blowing and snowing very cold, and a fearful sea running. The ice was breaking, lapping, and crushing. The sight was grand, but dreadful to us in our position. Mr. Meyer cast the kyak adrift, but it went to leeward of us. He can do nothing with the boat alone, so they are lost to us unless God returns them. The natives went off on a piece of ice with their paddles and ice-spears. The work looks dangerous; we may never see them again. But we are lost without the boat, so that they are as well off. After an hour's struggle we can make out, with what little light there is, that they have reached the boat, about half a mile off. There they appear to be helpless—the ice closing in all around—and we can do nothing until daylight. Daylight at last—3 a. m. There we see them with the boat; they can do nothing with her. The kyak is the same distance in another direction. We must venture off; may as well be crushed by the ice and drowned as to remain here without the boat. Off we venture, all but two, who dare not make the attempt. We jump or step from one piece to another, as the swell heaves it and the ice comes close together—one piece being high, the other low, so that you watch your chance to jump. All who ventured reached the boat in safety, thank God, and after a long struggle we got her safe to camp again. Then we ventured for the kyak, and got it also. Mr. Meyer and Fred. Jamkins fell into the water. Luckily, we had two or three dry shirts left, so that they could change. Most every man is more or less wet. Have taken our tent down and pitched it on the middle of our little piece of ice, with our boat alongside. Joe has built another hut alongside the tent. We have made our breakfast on a few ounces of pemmican and bread. Have set a watch, and the remainder of us have laid down to get some sleep, which we are in need of. Wind W. N.W. Still blowing a gale. I think there is a northeaster outside, by the way the pass has closed.

Wednesday, April 9.—Things were quiet last night. Wind N.W. Blowing a N.E. gale outside. The sun has shown himself for a few minutes. Mr. Meyer shot him; latitude 55° 51′ N. The sea runs very high, threatening to wash us off every minute. We are in the hands of God; may He preserve us. The ice is much slacker, and the water is coming nearer. Things look very bad. God knows how the night will end. Evening.—Washed out of our tent; Hannah from her snow-hut. Have gotten everything in the boat ready for a start; she can never live in such a sea. The sun has set very good. Land in sight. It has cheered us up. The women and children are in the boat. We

have not a dry place to walk about nor a piece of fresh-water ice to eat. The sea has swept over all. The ice is closing in fast; the wind and sea going down. Midnight, 12 o'clock.—Things look so quiet, and the ice so closed around, that we have pitched our tent, intending to have a sleep, for we are worn out.

Thursday, April 10.—Last night, quiet. Calm and cloudy; no sun has shown itself; very warm. The ice close around. We are prisoners yet.

Friday, April 11.—Calm; cloudy. We cannot be far from shore. We saw a fox, some crows, and small land birds. Mr. Meyer had his fingers and toes frozen the other morning. The ice is still close around us; nothing but ice to be seen. We have two large bergs nearly on top of us. Not a movement in the ice, so calm and still.

Saturday, April 12.—Light wind, S.E.; nearly calm; at times a little swell. We are still prisoners, the ice close. Saw some seals, but could not get them. Very hungry, and likely to be so. The sun shines for the first time in a good many days; very fine. Mr. Meyer took an observation; latitude 55° 35′ N.

Sunday, April 13.—Light wind, S.W. The ice opened last night, but closed again this morning; it remained open but a few hours. It has slackened a little to-day, but we cannot do anything in it. Last night, splendid northern lights. Mr. Meyer took an observation; 55° 23′ N. Saw some seals to-day, but the ice is neither open nor close, so we cannot do anything. We remain prisoners on this piece. All well.

Monday, April 14.—Wind light, N. The pack still closed; no chance of leaving here yet. See one or two seals every day, but cannot get them, as the ice will not allow up to go through or over it. Weather very fine; sea calm, or, I should say, the ice, as there is no water. Latitude 55° 13′ N. Our small piece of ice is wearing away very fast; our little provisions are nearly finished. Things look very dark; starvation very near. My trust is in God; He will bring us through. All well.

Tuesday, April 15.—Nearly calm; very light wind, N. The ice the same; no change. Cold last night; snow fell very thick; thought we would have a change in the weather. The sun shines as bright as ever. Splendid weather for making a passage, but we cannot start. Latitude 54° 58′. Mr. Meyer looks very bad. Hunger seems to have more effect on him than on the rest of us; he gets weak-looking.

Wednesday, April 16.—Wind increasing a little from N.N.W. The ice still the same; no swell on. My head and face have been swollen to to twice their usual size. I do not know the cause of it, unless it is the ice head-pillow and the sun. We keep an hour's watch at night. Some one has been at the pemmican on their watch, and I can put my hand on the man. He did the same thing during the winter, and on the night of the 7th I caught him in the act. We have but few days' provisions left. We came down on them this morning; rather weakening work, but it must be done to save life as long we can, which cannot be much longer, unless something good comes along, which I hope may soon happen. The only thing that troubles me is the thought of cannibalism. It is a fearful thought, but may as well be looked boldly in the face as otherwise. If such things are to happen we must submit. May God save us!

Thursday, April 17.—Light breeze from the W. S.W. The ice the same—no opening yet. Latitude 54° 27′ N. We shot the dogs last winter for stealing the provisions. If I had my way, with the consent of all hands, I would call out and shoot down that two-legged dog, who has since been at them. I see most of the men have their faces swollen, but not so badly as mine. All well, but growing very weak.

Friday, April 18.—Very light breeze from the N. Ten o'clock. Joe saw a small hole of water half a mile off. He took his gun and ventured over the loose ice. No sooner had he gotten there than he shot a seal, and sung out for the kyak, as the water made rapidly. It took an hour to get the kyak there and another to get back. It is a nice-size seal, and will give us three meals raw, and save us from starvation some days. The water is making quite a lead. A joyful sight met our view this morning when we turned out—the land in sight, bearing S.W. We could see it very plainly this morning, but the weather has become so thick that we have lost sight of it for the present. We returned thanks to God for His mercy and goodness to us; for we have only a few pounds of bread left and sufficient pemmican for to-night. The lead closed up again, but the push seems to have slackened. We had visitors to-day—a crow, two small birds, and a school of canvas-back ducks, about a hundred and fifty in number. I wish we could have gotten a couple of shots at them, and knocked down a meal or two. But they kept a mile or two off, so that we had to content ourselves with looking at them. We divided the seal very nicely, losing nothing but the gall. We divided it into sixteen parts. One man then turned his back, and called out the names, each man stepping up and taking his share of meat, blubber, and skin. The inside—heart, kidneys, liver, lights, and stomach—were divided between the Esquimaux and us. We then gave some blubber and rags, each, so that we got a fire under way, and cooked some good soup from what at other times I would call offal. Cut up fine in a quart of soup, with a little blood, the mess was highly relished. We then turned in for the night, thanking God for His protection and goodness, to dream of friends and happy days to come.

Saturday, April 19.—Light breeze from the N.W., with a very gentle swell on. The ice is getting much slacker. No land to be seen. Weather thick. No appearance of the sun to-day. Evening, threatening. Breezing up from the N.W. It must be blowing from the N.E. The swell increases.

Sunday, April 20.—Blowing a gale somewhere. The wind here from the N.W. Blowing a gale in the N.E. The swell comes from there, and is very heavy. The first warning we had—the man on watch sang out at the moment—a sea struck us, and, washing over us, carried away everything that was loose. This happened at 9 o'clock last night. We shipped sea after sea, five and ten minutes after each other, carrying away everything we had, our tent, skins, and most of our bed-clothing, leaving us destitute, with only the few things we could get into the boat. There we stood from 9 in the evening until 7 next morning, enduring, I should say, what man never stood before. The few things we saved, and the children, were placed in the boat. The sea broke over us during that night and morning. Every fifteen or twenty minutes a sea would come, lift the boat and us with it, carry us along the ice, and lose its strength near the edge, and sometimes on it. Then it would take us the next fifteen minutes to get back to a safe place, ready for the next roller. So we stood that long hour, not a word spoken but the commands to "Hold on, my hearties, bear down on her, put on all your weight;" and so we did, bearing down and holding on like grim death. Cold, hungry, wet, and little prospect ahead. At 7 o'clock there came close to us a small piece of ice, which rode dry, and we determined to launch the boat and reach it, or perish. The cook went overboard, but was saved. Landed there in safety, thank God. All well. Tired and sleepy.

Monday, June 21.—Last night and yesterday all hands wet. Nothing

dry to put on to-day. There is little to dry, but we have stripped off everything we can spare, and are drying them. The men are divided into two watches. sleeping in the boat and doing the best we can. Hunger disturbs us most. Nice breeze from the N.E. The ice around very pressing and thick. We cannot get the boat through, and must remain for a change. The sun has shown himself only sufficiently to get an observation; latitude 53° 57′ N.

Tuesday, April 22.—Weather very bad. Last night commenced with snow-squalls and sleet, and finished with rain. Rained all the night, and until 12 o'clock to-day. Still remains very thick. The ice in pash inclosed around us. It appears to me we are the sport and jest of the elements. The other night they played with us and our boat as though we were shuttlecocks. Men would never believe, nor could pen describe the scenes which we have passed through, and yet live. Here we are, half drowned, cold, and with no means of shelter. Everything wet and no sun to dry them. The scene looks bad; nothing to eat. Everything finished if some relief does not come along. I do not know what will become of us. Fearful thoughts enter my head as to the future. Mr. Myer is starving; he cannot last long in this state. Joe has been off on the ice three times to-day, the little way he can get, but has not seen anything. Chewed on a piece of skin this morning that was tanned and saved for clothing; rather a tough and tasteless breakfast. Joe ventured off on the ice the fourth time, and after looking a good while from a piece of iceberg, saw a bear coming slowly toward us. He ran back as fast as possible for his gun. All of us laid down and remained perfectly still, Joe and Hans going out some distance to meet the bear. Getting behind a hummock, they waited for him. Along came Bruin, thinking he was coming to a meal instead of furnishing one himself. Clack, bang went two rifles, and down went Bruin to save a starving lot of men. The Lord be praised; this is His heavenly work! We cannot catch seal for the pash-ice, and we are on a bad sealing-ground. He therefore sends a bear along where bears are seldom seen, and we certainly never expected to find one. The poor bear was hungry himself; there was nothing in his stomach. Joe, poor fellow, looked very much down on our account. Everything looks bright again but the atmosphere; it looks threatening.

Wednesday, April 23.—Wind E.N.E., and later in the day N.N.E., where I hope it will remain. The weather still disagreeable; full of rain-squalls and cloudy. Living nearly on raw bear-meat. Everything wet, but brighter days coming soon. It cannot last much longer. Here we are surrounded with the miserable pash-ice, and cannot get free. All well.

Thursday, April 24.—Wind N.N.E.; sometimes hauls around to the N. Raining all night and to-day. Everything wet for some days past and no chance of drying them. Saw a large school of ducks at 4 a. m., and another later in the day. Cannot be far from land; we have been allowed to see it sometimes, but were driven off again. There was a fine lead of water last night; I thought we were going to have a change, but it soon closed up again. Another lead to-day, but farther off.

Friday, April 23.—Wind increased to a gale last night from the N.E. Raining all night and to-day, with snow-squalls. Launched the boat at 5 a. m. The case was desperate; running with a light-built boat, damaged as she is, patched and scratched all over. But what were we to do? The piece of ice we were on had wasted away so much it would never ride out the gale. Our danger to-day was very great; a gale of wind blowing; a crippled boat overloaded; and a fearful sea running,

filled with small ice as sharp as knives. But, thank God, we came safely through it. We are all soaking wet, in everything we have, and no chance of drying anything. We have had neither sun nor moon for over a week. Not a single star have I seen. All is dark and dreary, but, please God, it will soon brighten up. We have struck the sealman's grounds. I never saw such an abundance of seals before; they are in schools like the porpoise. We hauled up on a floe after eight hours' pull; could make no westing. Shot some seals, but they all sunk; Joe shot them. Hard times.

Saturday, April 26.—Joe shot a seal last evening and broke the charm. Haus shot one this morning. Last night and this morning fine. Ice very thick around. Started at 6.30 a. m., and were beset two hours afterward. Pulled up on a small piece of ice; the best we could find. Snowing all day. Repaired the boat here, which it wanted, and the weather cleared up in the afternoon. Got some things dried a little, and half of us turned in. Hans shot a seal, making two to-day.

Sunday, April 27.—Yesterday, wind light from S.E.; in the evening changed to N.E., blowing strongly. Mr. Myer took an observation yesterday; latitude 53° 30′ N. Snowed all night and this forenoon. Cleared up this afternoon, but remains thick and somewhat cloudy. Plenty of water all around, but cannot get to it. All well.

Monday, April 28.—Gale of wind sprung up from the W.; heavy sea running; water washing over the floe. All ready and standing by our boat all night. Not quite so bad as the other night. Snow-squalls all night and during the forenoon. Launched the boat at daylight, (3.30 a. m.,) but could get nowhere for the ice. Heavy sea and head-wind; blowing a gale right in our teeth. Hauled up on a piece of ice at 6 a. m., and had a few hours' sleep, but were threatened to be mashed to pieces by some bergs. They were fighting quite a battle in the water, and bearing right for us. We called the watch, launched the boat, and got away, the wind blowing moderately, and the sea going down. We left at 1 p. m. The ice is much slacker, and there is more water than I have seen yet. Joe shot three young bladder-nose seals on the ice, coming along, which we took in the boat; 4.30, steamer right ahead, and a little to the N. of us. We hoisted the colors, pulled until dark, trying to cut her off, but she does not see us. She is a sealer, bearing S.W. Once she appeared to be bearing right down upon us, but I suppose she was working through the ice. What joy she caused! We found a small piece of ice and boarded it for the night. Night calm and clear. The stars are out the first time for a week, and there is a new moon. The sea quiet, and splendid northern lights. Divided into two watches, four hours' sleep each. Intend to start early. Had a good pull this afternoon; made some westing. Cooked with blubber-fire. Kept a good one all night, so that we could be seen.

Tuesday, April 29.—Morning fine and calm; the water quiet. At daylight sighted the steamer five miles off. Called the watch, launched the boat and made for her. After an hour's pull gained on her a good deal; another hour, and we got fast in the ice; could get no farther. Landed on a piece of ice, and hoisted our colors from an elevated place. Mustered our rifles and pistols, and fired together, making a considerable report. Fired three rounds, and was answered by three shots, the steamer at the same time heading for us. He headed N., then S.E., and kept on so all day. He tried to work through the ice, but could not. Very strange; I should think any sailing-vessel, much less a steamer, could get through with ease. We fired several rounds and kept our colors flying, but he came no nearer. He was not over four or five miles distant.

Late in the afternoon he steamed away, bearing S.W. We gave him up. In the evening he hove in sight again, but farther off. While looking at him, another stranger hove in sight, so that we have two sealers near, one on each side of us, and I do not expect to be picked up by either of them. At sunset sighted land S.W., a long way off. Mr. Meyer took an observation to day; latitude 53° 4′ N. Hans caught a seal, very small and young; a perfect baby of a seal. Dried most of our things to-day.

Wednesday, April 30.—Five a. m.; weather thick and foggy. Glorious sight when fog broke; a steamer close to us. She sees us and bears down on us. We are saved, thank God! We are safe on board the Tigress, of Saint John's, Captain Bartlett. He says the other steamer could not have seen us, as the captain is noted for his humanity. The Tigress musters one hundred and twenty men, the kindest and most obliging I have ever met. Picked up in latitude 53° 35′ N.

Thursday, May 1.—Weather very fine. Going north, sealing. The steamer we saw on the 29th was the Eagle, of St. John's, Captain Jackmann, noted for his humanity in saving life. He has received two medals for saving life. The captain of this steamer says if that man had seen us. and could not have gotten to us with the steamer, he would have sent his men on the ice and carried us off. Caught some seals to-day. Joe is in his glory, shooting seals. We are getting on first-rate, eating and sleeping.

Friday, May 2.—Morning thick and cloudy, with snow-squalls. Boarded by the captain of the Walrus, Captain De Lang. Two other steamers close to us, going N. Very few seals caught yet; weather and ice unfavorable. Afternoon; increased to a gale; blowing very heavily. The night promises to be very severe. The crew on board this steamer, one hundred and twenty in number, are like a band of brothers. They are all Newfoundland men, and are very kind to each other. No wrangling there; a new thing on board ship.

Saturday, May 3.—Blowing a fearful gale from N. N.W., with a heavy swell from the N.E. Blowing fearfully all night, and continues to do so. These steamers must be very strong; they endure great punishment. She is in the ice, getting knocks that one would think would go right through her, but the men seem to think nothing of it. We are treated with the greatest kindness by them; they never think they are doing enough for us.

Sunday, May 4.—Surrounded in the ice. Gale continued last night and this morning; lost its force at noon. Blowing very strongly from N.W. Weather clear but cold; more like March than May. Had divine service to-day—the first we have had since Captain Hall's death. We had some of the bear-meat left when the steamer came along; so the bear saw us out of danger and the Tigress took us from it.

Wednesday, May 5.—The steamer beset in the ice. A man from aloft saw a large number of seals, some four or five miles off. All hands over the side, and made for them. The captain's son no sooner arrived there and fired the first shot than the cartridge burst, and shattered his hand very badly. Some of the men came back with him, spoiling their work for some time. They killed seven or eight hundred seals before sunset. The steamer could not come to their assistance, so they left them on the ice all night. The men seem to be afraid the other steamers will make free with them. They are close to where they were killed. We have been steaming all day, trying to force a passage, but the ice is too close; it may open and let us through to-night. The Esquimaux and most of our men are complaining of swollen legs and feet, diarrhea, and severe

headache. All of us are suffering with something. I wish we were ashore, so that we could get some medicine; we are in need of it.

Tuesday, May 6.—Very dirty day. Strong wind N.N.W. The crew started for their seals at the first streak of day. Nearly all of them were stolen by the other steamers. The ice slacked a little, and we pushed the steamer through, so that we got our men, and what seals were left, on board. They marked their seals; so there will be a lawsuit over it. Blowing a heavy gale from the N.W. One of the sealers has had her side beaten in by an iceberg.

Wednesday, May 7.—Blowing a heavy gale all night, N.W. Seven a. m., turned her head S., and are running out the ice; looks like going home. The engine broke down; now repairing it. She answers well under canvas. Think we shall arrive in Saint John's on Friday morning. We are all very ill. I think if we had run into warm weather quick we would have been much worse. Some medicine and a little care will set us all right.

Thursday, May 8.—Very light breeze from the N. Still under sail. Will be in Saint John's early in the morning, I think 4 p. m. Engine started. Under steam. We are going to Bay Roberts, first to land the boats and sealing-gear. Then they will start for Saint John's; Conception Bay it is called. The principal harbor is called Harbor Grace; quite a fine little town. There the principal merchants live. A great many sealers go in there.

Friday, May 9.—Bay Roberts. Went on shore, where we were received very kindly by the inhabitants. The American consul, from Harbor Grace, and other gentlemen, came to see us, and were very kind, doing all they possibly could. Several kind persons came from there, and showed the greatest kindness to us. We are getting paid for our sufferings while on the ice. It is a very splendid bay, with very neat and comfortable houses. The people are very intelligent and kind.

Saturday and Sunday, May 10 *and* 11.—Very fine. Receiving and paying visits. The inhabitants are doing all they can for our relief and comfort. Mr. J. Kelpam, the man we are living on shore with, is very kind, giving us the use of his horses and carriage, driving us out himself, showing us the country, and naming all interesting places, free of charge.

POLARIS INVESTIGATION—CONTINUED.

WASHINGTON, D. C., *October* 11, 1873.

Examination conducted on board United States steamer Tallapoosa at the navy-yard, Washington, D. C., of the party under Captain Buddington, from the North Polar Expedition in the United States steamer Polaris, said party having been rescued by the whaler Ravenscraig, carried to Dundee, Scotland, returned to New York City, and brought from that port to Washington by the Tallapoosa.

The names of the rescued party are as follows:

Captain S. O. Buddington.
First Mate H. C. Chester.
Second Mate William Morton.
Dr. Emil Bessels.
First Engineer Emil Schumann.
Second Engineer A. A. Odell.
Seamen Herman Siemans, Henry Hovey, and Noah Hayes.
Carpenter Nathaniel Coffin.
Fireman Walter Campbell.

At 11.30 a. m. Hon. George M. Robeson, Secretary of the Navy, accompanied by Commodore Reynolds, and Captain Howgate, of the Signal Service, assembled at the navy-yard on board the Tallapoosa, for the purpose of taking the statements of the rescued party.

The first witness who was examined was Captain S. O. BUDDINGTON, who, in reply to interrogatories, testified as follows:

By Secretary ROBESON:

Question. Captain, you are aware that, when the party from the Polaris who were on the ice-floe arrived, we thought it proper to examine them and obtain their full statements with a view to preserving everything, not only that the Government may be informed of what has been done and what has been omitted, but that whatever there was of value to history or science might be secured at once; it seems also proper that we should go on with your party in the same way, so that we may have the statements of everybody freely and fully made from their own recollection of what occurred. We have sent for you first as the commander of the expedition after the death of Captain Hall, and we desire you to give a statement, so far as you can, of everything which seems to have any reference to the subject-matter. What is your name?

Answer. Sidney O. Buddington; I live in Groton, Connecticut; my profession is whaling.

Question. How long have you been engaged in that business?

Answer. Since the summer of 1840.

Question. State on what ships, so far as you can recollect.

Answer. The Julius Cæsar, William C. Nye, of New London; the Minerva Smith, of New Bedford; the Franklin, of New Bedford. I sailed two voyages in the William C. Nye. I sailed two voyages in the McClellan, of New London, and four voyages in the brig Georgiana, of New London, and one in the bark George Henry, of New London; also three in the schooner Franklin, of New London.

Question. You commanded some of those ships?

Answer. Yes, sir.

Question. State fully what positions you occupied on board of them.

Answer. I was mate of the Minerva Smith, the Franklin, and the McClellan, and second mate and boat-steerer in the William C. Nye. I was before the mast in the Julius Cæsar. I was also mate of the McClellan two voyages. I was master of the brig Georgiana four voyages, and of the George Henry one, the schooner Franklin three, and the bark Odd-Fellow one; the Concordia one.

Question. Had you been much in the northern waters previous to this voyage?

Answer. Since the spring of 1850. On the 7th of March I sailed for that country as mate of the McClellan, of New London.

Question. You cruised in what waters?

Answer. We were in Baffin's Bay and Davis Straits, and several times during the season in sight of Cape York, but couldn't get through.

Question. You have never been higher than Cape York before?

Answer. No, sir.

Question. Had you ever spent a winter north in those waters?

Answer. Ten before this voyage. In Frobisher's Bay and that vicinity—what is named now Cyrus Field's Bay. I spent two winters there, and two in what is called Cornelius Grinnell's Bay, and the rest in Cumberland Gulf. I sailed with the Polaris from Washington when she left here as sailing and ice master; went from here to New York, and from New York to New London; from New London to Saint John's, and from Saint John's to Fiskernaes; next to Holsteinberg, and then to Disco. After leaving Disco we went to Upernavik, and from there to a little place where we just stopped, but did not anchor. Captain Hall went ashore and got a few dogs. We anchored at Tessuisak.

Question. Did anything of interest happen after you left New York to the time you anchored at Tessuisak?

Answer. Nothing, except that there was some little difficulty in Disco; Captain Davenport came aboard and had a talk about it. Captain Hall had a very slight difficulty with me about some of my—well, it was a very careless trick in me, and he gave me a reprimand on leaving St. John's. I apologized about it in the best way I could, and there was nothing more thought about it by either him or myself. After we left St. John's Captain Hall came to me about 2 o'clock one night; we were bound for Holsteinberg; he said that he wanted to go into Fiskernaes; we were then nearly abreast of it, and he wanted me to change my course and go there. I got up, looked at the chart, went on deck, and had the course altered; that was all of any note that happened. Nothing of any great importance happened after we left Tessuisak until we got to the latitude which Captain Hall made, 82° 26′.

I have here my general report of the proceedings of the ship, which was written after we were rescued, and while on board the whaler Ravenscraig. I dated and signed it at Dundee, Scotland, the 27th of September, 1873. It contains a general report of the operations of the ship, and of my proceedings, more especially after Captain Hall left the ship

to go on his final sledge journey. It contains substantially all that occurred, and I can supply any further information you may desire by my personal examination.

Question. Describe generally what you did after you left Tessuisak.

Answer. We ran to the westward twenty-five miles in a thick fog among heavy bergs; ran very slowly through the night about twenty-five miles; we shaped the course for Cape York, and nothing of any importance happened; we met with a very little ice. The next day, in the afternoon, we raised Cape York not far from 6 o'clock. The next morning we had some little ice to contend with, but none to speak of until we got up abreast of Cape Parry, (or Perry;) there we had quite a lot, but it was very light, and we got through with it quite easily. We passed Cairn Point; from there we shaped the course for Cape Frazier; as we came up to Cape Frazier the ice made in close to the land. Captain Hall landed there and staid a few minutes with the boat's crew. Mr. Chester, I believe, landed with him. There was quite a strong tide setting to the southward at the time, and we were up to the heavy ice then; that is where we first came into the heavy ice. We passed that, and up Kennedy Channel we had no ice at all, nothing to speak of, or to prevent the ship from going where she chose. We had some fog. The next morning after passing through Kennedy Channel the fog was very thick. We stopped to get observations at 12 o'clock, and got some very good ones. Most of us, and myself among them, got 81° 20′. That was the morning after passing through Kennedy Channel. I should have to refer to dates to give them to you. After 12 o'clock the fog lifted, and we had a clear run, with a strong head-wind, however, up through that open place shown on Meyer's chart, which, in my way of talking, I have called "Hall's Basin." It is the widest part of the channel there between the shores. We had passed Cape Constitution clear of ice, and we passed Cape Lieber clear of ice; a little was sticking to the shore, but not much. We passed Lady Franklin's Bay, which we did not see, as we were rather on the other shore. We passed up to Robeson Channel. The wide part is across from what is now called Polaris Bay to Cape Lieber on the west side, and stretching up to Wrangel Bay on the same side.

Question. You have been accustomed to calling the water between what is known as the Southern Fiord and Franklin Bay, which makes the widest part there, Hall's Basin?

Answer. Yes, sir. The ice at Cape Frazier extended pretty close to the shore, but left room inshore to go by, as we passed. We had no more up the channel. We went on with clear water but a head-wind through this basin up into the straits above, not making any stop, except that one, to get our observations. We passed by the mouth of Newman's Bay and saw it was clear of ice. In the morning, about 4 o'clock, we came to a full stop, and Captain Hall told me to go in on the east side. There was no chance to get westward or any way, except into the east from where we were, and he said we would look for a harbor. I accordingly steered square in across the channel for the east side and ran alongside of one heavy floe about six miles, by Walker's patent log, and in the evening the captain tried to land with Captain Tyson; but the tide was running so fast he could not get ashore without losing his boat, on account of the ice. That night we had it foggy. That was at what is called Repulse Harbor, above Newman's Bay. The next morning he tried to land again. We knocked about that night and took every advantage to get north that we best could, but did not succeed. It was foggy during the night—somewhat misty. Next morning Captain Hall

landed again with Mr. Tyson—or rather tried to land at the same spot, but they couldn't get ashore. They came near losing their boat, as was reported to me. It was all I could do to keep the shore there, the heavy floe was going so fast. There was a little water inside, but it was a very strong tide. It was about the full of the moon, I think; I do not recollect now, exactly; but I know there was a very strong tide running to the south. We had the ship under steam, and when Captain Hall came aboard he took a look at it, and I recommended strongly that we should go to Newman's Bay, which would be an open place. That was about eight or ten miles south of us. That was the only place I could see, and I thought it best to go in there, and if the channel cleared we could see it and be open to it, and not run the risk of getting beset in the ice in trying to stay out there. He held a council with the officers—Dr. Bessels and myself, and the others—which I have here, that was written down as it occurred, I believe, word for word. (Paper is now marked "No. 1, B.")

It read as follows:

"Consultation held on board the Polaris in regard to getting further north with the vessel, the vessel being on the east side looking for a harbor. Dr. Bessels, Mr. Meyers, Captain Tyson, Captain Buddington, Mr. Morton, and Mr. Chester. Doctor wanted to cross the straits to look for a harbor, as being better for sledge journeys, while the east side was better for navigation, if we could not get further north. Mr. Morton coincided with Dr. Bessels; Mr. Meyers had the same opinion; Mr. Chester to get as far north as possible; Captain Tyson to get into harbor as soon as possible; Captain Buddington to keep on east side as being better for navigation, and certainly better for sledge journeys. It was impossible to get further north on account of the pack. Go along the coast on the east side of the straits southward until a harbor is reached, which could be done in a short time. There had been seen one a few miles to the south of present position of the vessel. It was decided by the commander to cross the straits. In doing so we got beset by the pack and drifted back about fifty miles."

Captain BUDDINGTON, (resuming:) That paper was written down at the time, and it was the same in Captain Hall's journal, which, unfortunately, has been lost. It was left on the ice.

Question. Is this paper in your handwriting?

Answer. No, sir; it was written by my instructions. It is a record of the consultation and opinions given at the time, written down by my instructions by Captain Hall's clerk, perhaps about a week after it occurred. The same thing was written down by Mr. Meyers in Captain Hall's journal. Captain Hall once read it to me from his journal, and I got the clerk to write down a copy of it, which is this copy. There was something said, I believe, on board the ship about it not being a proper way to do business, or something of that kind, and I spoke to Captain Hall about it. This statement is entirely correct, not only according to my recollection at the time when it was written down, but according to my recollection now, and according to my recollection from Captain Hall's journal, and it is according to my recollection of the facts as they occurred.

Question. What happened then?

Answer. Captain Hall told me to cross the straits, and if we could not succeed we would come back and go into this bay, now called Newman's Bay on the chart, but in doing so we got beset in the heavy ice and drifted away to the southward. We were drifting part of the time against quite a strong southerly wind.

The 4th of September, at night, we got out. The ice slacked up and we had steam on. We had landed some provisions during this time in a heavy floe, but had got them back on board. We were fast between two heavy floes, and we landed all our deck-load, pretty much, and a good deal from below. As the ice began to slack up we took it aboard again, and on the evening of the 4th of September the ice slacked up so that we succeeded in getting inshore and got into the lead of water that made inside from Cape Lupton. There was always water there when there was any anywhere; we had it all summer there, more or less. After the ice first broke we could not get back into Newman's Bay though. The ice swept up the bay to Cape Lupton. Captain Hall went on the ice and looked for himself, and told me there was no use to try to go up any further. We could not get up Robeson Channel on account of the ice, which swept close in to Cape Lupton; it did so all the summer. I tried several times to get up there, and I always came to a stop. Getting back to the ship you would think you could go right by by the looks of the water, but as soon as you would get up, there was a block. Finding we could not get up we went to landing our provisions and stores and made ready to winter there. This was the place which Captain Hall called "Thank God" Harbor. We landed pretty much everything that we wanted to land and made all the room in the ship that was necessary. We put up the observatory on shore.

During the month of September Mr. Chester and the doctor went on a musk-ox hunt, and returned, I think, on the 26th.

Afterward a party went to the southward, Mr. Meyers among them, a short journey of one day to get some bearings of the other shore. They were sent by Captain Hall. Some of the Esquimaux were out sealing a good deal of the time and general work was going on. Until Captain Hall started north on a sledge journey, things were going on very quietly and appeared to be all right.

I here produce the orders which he left me.

The said orders, comprising eight pages of foolscap, are now marked "No. 2, B," and read as follows:

"UNITED STATES STEAMSHIP POLARIS, C. F. Hall, commanding.
(Official.)

"SIR: I am about to proceed on a sledge journey for the object of determining how far north the land extends on the east side of the strait in which the Polaris is wintering, and also to prospect for a feasible inland route to the northward for next spring's sledging, in my attempt to reach the north pole; this route to be adopted providing the ice of this strait should be found so hummocky that sledging over it should be impracticable, and furthermore to hunt musk-cattle, believing and knowing as I do, from experience, that all the fresh meat for use of a ship's company thus situated—as is that of the Polaris—should be secured before the long arctic night closes upon us.

"You will as soon as possible have the remainder of the stores and provisions that are on shore taken out under the plain by the observatory and there placed with the other stores and provisions in as complete order as possible. You will have each kind by itself as near as may be. You will have the ship's houses (winter awnings) put up as designed. Have the night-watch kept up in accordance with my written instructions of September 23, with merely this change: that the watch is to be continued until the cook commences his morning work. Have every light in the ship extinguished at 9 p. m.; except from this hour a candle-light is to be allowed forward for the use of the watch.

"You will see that no more coal is consumed in any stove of the ship than actually is necessary. I find by the thermometer, placed in the men's quarters forward and both cabins aft, that the temperature of the air is kept far higher than it should be, both for economy in the consumption of coal and for the health of the ship's company, the thermometer through the day and evening ranging from 60 to 70 degrees. Therefore you will require no more coal shall be consumed than is necessary to keep the thermometer, forward and aft, at 50° through the day and evening. A very small fire to be allowed forward, to be kept up from 9 p. m. through the night; but the one aft to be discontinued at 9 p. m. Have the dogs well cared for, feeding them every other day. Look out some good warm place in the ship for the puppies, and have them well nursed.

"Have Mr. Morton get and open one can of pemmican, and deal it out economically to the puppies.

"I have great hopes of securing many musk-cattle on my sledge journey, and then we can spare much of our ship's provisions to the dogs. Should any such calamity be in store for the Polaris—which I pray to God may not be—that a storm from the northward should drive the ice out of Thank God Harbor, and the Polaris with it, during the coming spring-tides, then have steam gotten up as quickly as possible, and lose no time in getting the vessel back again to her former position; but should the Polaris be driven into the moving pack-ice of the straits and become beset, and you should not be able to get her released, then, unfortunately, the vessel and all on board must go to the southward, drifting with the pack, God only knowing where and when you and the ship's company will find means to escape. It might, in this case, be that such a drift movement would occur as in the case of the United States Grinnell expedition of 1851–'52, and of the Fox, under McClintock, 1857–'58; and whenever you should get released, if anywhere between Cape Alexander or Cape York, or between the latter and the arctic circle, you will then make your way to Godhaven, in Disco Island; and if the Polaris remains sea-worthy you will fill her with the coal, stores, and provisions, and the next fall, of 1872, steam back to this place.

"If the vessel should become a wreck, or disabled from the imminent exposure and danger of such an ice-drift as referred to, then all possible use of your best judgment must be brought into play for the preservation of the lives of all belonging to the expedition.

"You will, at your earliest moment of escape, acquaint the Government of the United States with the whole of the circumstances; and should one of those circumstances be the loss of the Polaris, I, and my small party that is absent to accompany me in the proposed sledge journey, would remain here to make discoveries to the north pole, making Thank God Harbor our headquarters, and all the time feel certain that our country would lose no time in sending us aid in carrying out the great object of the expedition.

"Although I feel that it is almost certain that the Polaris is safely lodged in her winter position, yet we know not what a storm may quickly bring forth. A full storm from the south can send the pack of the strait impinging upon the land-pack in the midst of which we are, and in a few minutes cast the Polaris high and dry upon the land.

"During the coming spring-tides let great vigilance be exercised, especially during any gale or storm, at the time of high tides.

"As soon as time will al ow, have snow-blocks cut from the drifts under the lee of the hill by the observatory, and sledged over to the Polaris, the same to be placed about her as an embankment.

"You will have plank and boxes so placed under the poop that the dogs cannot get to the raw-hide wheel-ropes.

"The usual routine of the ship that I have established will be gone through with each day during my absence. You will see that this is carried out, including church-service each Sabbath.

"The duties that devolve upon Mr. Morton, by my appointment, are that of paymaster and yeoman. He has full charge, under my direction, of all the accounts, stores, and provisions on board the Polaris, and on shore, belonging to the United States.

"Whatever relates to the consumption and use of said stores and provisions, Mr. Morton has charge of and will be made responsible for the same. I am sure this trust which I have committed to Mr. Morton will be carried out with fidelity, and to the best advantage of the service of the United States Government in this its North Polar Expedition.

"All the fuel, kindling, and coal before being used must pass through the hands of Noah Hayes, who must keep an exact account of the same, which he must vouch to Mr. Morton, or he may render the amount to the chief engineer and the latter to Mr. Morton; no box, barrel, or anything else, furnished with provisions, must be opened by Mr. Morton. So far as these and all other orders I have issued, you will have carried out. You will keep a journal of all proceedings during my absence and transmit the same to me on my return. You will not omit to note such violations of orders that are or may be given, and by whom; nor will you omit to note the conduct of any and all. Hoping that God will protect you and help you in the discharge of the duties that devolve upon you, I bid you adieu and all those of my command, trusting on my return to find all well, and trusting, too, that I shall be able to say that my sledge journey, under the protection and guidance of Heaven, has been a complete success, having made a higher northing and nearer approach to the north pole than any white man before, and that a practicable inland sledge route further north has been found, that many musk-cattle have been seen and captured.

"I have the honor to be your obedient servant,

"C. F. HALL,

"*Commanding United States North Polar Expedition*,

"*Latitude* 81° 38′ *North*, *Longitude* 61° 44′ *West*, *October* 10, 1871.

"To S. O. BUDDINGTON,

"*Sailing and Ice Master, United States North Polar Expedition.*"

Captain BUDDINGTON, (continuing:)

The captain went on his journey. He started, I think, about 2 o'clock in the afternoon. He encamped five miles from there. Next morning he sent Hans back after some things, a pair of seal-skin pants and one or two little things which I think he has mentioned. Part of his request was mentioned in that little book. He sent me a letter, too, which I have not got, and I wrote back to him particulars and sent the things. Hans left, I think, about 1 o'clock that day. I sent him a letter that everything was right, and detained Hans a short time to have the pants fixed. He was gone until the 24th of October. I never heard of him any more after Hans left the ship till he returned. In the mean time everything was very quiet, and I was at work according to those instructions. He returned about 2 o'clock on the 24th of October. I saw the sledge coming, and I went ashore to meet him, and met Mr. Chester first and asked him how everything was; they said they were all well, had a good time, &c. When I came to Captain Hall he was

very lively. I met him on the shore at the top of the bank. He gave up his sled then and was walking down. I came up to Chester first, who was just ahead of him a short distance. I walked off to the ship with him. He spoke very favorably of the land journey, and thought that there was a good chance to travel some ways north on that side, and spoke of seeing signs of musk-ox; had shot two seals in Newman's Bay, called it an uncommon good harbor, and wished he was in it. He appeared lively. I asked him if there was a good road up this side to get north. He says "Yes; I can go to the pole, I think, on this shore." We were then housed over and banked up with snow on the outside, and a door to go in over the rail. He went in, and I went to my work on the outside of the ship, banking up with what men we had on the outside, putting snow around for winter protection. In about an hour and a half, more or less, after that, he sent out for me. I went in, and he was then in his bunk, and said he felt a little sick coming in out of the cold, and had been vomiting slightly. He told me to have the sleeping-bags dried and everything put in order; that he wanted to go south day after to-morrow and look at this fiord that is now on the chart, and wanted Mr. Tyson to go with him. He said he thought he had a bilious attack, and inquired of me if I didn't think he needed an emetic. I told him "yes." Dr. Bessels stood by, and said it would not do for him to take an emetic. I had given him a great many first and last. Even at home, a few days before we went away, I had given him an emetic. He was very subject to those bilious attacks.

Question. Did you say that he said he was sick from having come in out of the cold?

Answer. That is what he spoke about. He said he felt sick at the stomach and had been vomiting, from coming in out of the air. He said he thought he was bilious and had better take an emetic, and asked me if I didn't think so. Dr. Bessels was present, and he said he didn't think it would do for him to take an emetic. He gave no reason that I know of. If he did, I don't really know what it was. I don't recollect what he said about it, only it wouldn't do for him. It was not far from two hours after he came on board—an hour and a half or so. I should say an hour and a half safely. Mr. Morton was attending to him, and he was getting some clothes for him to shift his clothes when he went to bed. When he came back from going into his state-room to get the clothes he told me that he was abed then. I don't know how long he had been abed when I came aboard. From that time he grew worse. I kept on with the regular work as it had been under his instructions, and he would at times be perfectly rational and then he would give some orders that I attended to, and kept on from that to the 8th of November. He was sometimes out of his head. I think it was two days before he was taken down the last time he was, as I supposed, entirely well. Even the last day he told me, "I shall be in to breakfast with you in the morning, and Mr. Chester and Mr. Morton need not sit up here with me at night. I am as well as I ever was." He dictated some writing that day to his clerk. He read a good deal, and in the afternoon he had quite a nap in his chair. Hannah was with him. That night I went to bed at the usual time. He was sitting up. I slept alone. I saw him sitting there. Shortly after 12 o'clock, I think it was, Chester aroused me up and says, "Captain Hall is dying." I ran up as quick as I could. He was sitting in the berth, with his feet hanging over, his head going one way and the other, and eyes very glassy, and looking like a corpse—frightful to look at. He wanted to know how they would spell "murder." He spelled it several different ways, and kept on for some time. At last

he straightened up and looked around and recognized who they were, and looked at the doctor. He says, "Doctor, I know everything that's going on; you can't fool me," and he called for some water. He undertook to swallow the water, but couldn't. He heaved it up. They persuaded him to lie down, and he did so, breathing very hard. When I first went up I asked Mr. Chester what he had been taking. He said the doctor gave him something just as he was going to bed, and he went right to bed and went to breathing in this way, very hard. It appeared to be not exactly a snore, but between hard breathing and a snore all the time. This was along after 12 o'clock, between that and 2. The next morning he came out, and appeared to be as strong as he ever was. As quick as he got up they called me, and I went in. The doctor was in there, and he looked around among us and wanted me particularly to note down what he said, as it would be interesting when he got well.

Question. Who wanted you to do that?

Answer. Captain Hall; he was crazy—out of his head. He stayed up for a few minutes and called for some more water; tried to drink it, and couldn't swallow it. He lay down again and went to sleep; that is, I supposed he was asleep by the way he was breathing. He never got up again, and died that night, somewhere along about 2 o'clock.

Question. Do you know whether he took any medicine that day?

Answer. Nothing but injections, as I understood. I never saw them, but he never took any medicine during the day. I understood the doctor used an injection, as he said, of quinine. He told me so. The doctor, I mean, told me so.

Question. When Captain Hall talked in this way, which you have detailed, was he in his right mind?

Answer. No, sir; not all the time. When he talked about being in to breakfast and dictated some writing, &c., he was in his right mind—perfectly well. That was the night before he was taken down.

Question. I mean after he was taken down.

Answer. No, sir.

Question. He never appeared to be after that?

Answer. No, sir; not after I was called up that night by Mr. Chester, and went up. He never was in his right mind. He only spoke twice after that.

Question. Did he seem to have an idea that people were poisoning him, or murdering him, or something of that kind?

Answer. Yes, sir; always. He insisted upon it.

Question. Did he accuse anybody in particular?

Answer. Yes, sir.

Question. Who?

Answer. Dr. Bessels. At times he thought everybody was at it. But he appeared to spit out his whole venom on him; that is, he appeared to think that the doctor was the proper one.

Question. At times, you say, he seemed to think that everybody was doing it?

Answer. Yes, sir.

Question. Who else did he accuse besides the doctor?

Answer. I believe the cook, one night. He told me that the cook had a gun in his berth and was going to shoot him. The cook slept on the opposite side. I went over and overhauled the berth; there was nothing there, of course. One night I was up in the cabin and Captain Hall got hold of me pretty severely: I called to Mr. Chester and Mr. Tyson to come up. They were down below. Captain Hall knew what I said,

and held me by one shoulder, and took hold of the door-knob and held it tight, and they had some difficulty in getting the door open.

Question. What did he take hold of you for?

Answer. I really could not tell. He was just in that way. He said that there was blue around the lamp, and blue gas coming out of my mouth, and everything of that kind. He said also the same to Mr. Tyson. He would feel for his mouth, when he was close by him, and say "What's that coming out of your mouth? It is something blue." One night Mr. Chester or Mr. Morton, I do not recollect which, put a pair of stockings on him—the others were wet; he had stepped in the water. He objected to it very strongly, and said they were poisoned; but they finally persuaded him to have them on. I believe that Hannah came in and put the stockings on. He would not allow anybody else to do it.

Question. Did he take his meals all this time?

Answer. No, sir; he never went to the table, but he used to eat quite freely, so I understand, but I don't know. I was not in a great deal of the time. I generally went when I was called for. I had a good deal to do at the time. Mr. Chester, Mr. Morton, the doctor, and the Esquimaux woman were attending to him. He used to take some wine, I believe, and I saw tamarind-water. He used to drink that, so they told me, and I saw it in the dishes around there.

Question. Who lived in the cabin with him?

Answer. The engineer, Dr. Bessels, Mr. Bryan, Mr. Myer, the cook and steward. Morton, Chester, Tyson, and myself were below with the Esquimaux family and the second engineer.

Question. What was the condition of Captain Hall's mind during his first attack?

Answer. About the same as the last one, only not so bad. He was quite delirious one spell, and he got partially over it, during the first attack, and he sent in for Mr. Chester, Mr. Morton, and Mr. Tyson. He was not exactly right then, but nearly so. He told them then that he wanted to give up the care of the ship to me entirely; that the crown fitted him too tight; that he had enough to attend to his surveys, and he didn't want to be bothered any more with the ship or crew. Mr. Myer lay in his berth, I believe, at the time and heard it. Apparently anybody who was not acquainted with him would have thought that he was entirely rational then. He was not, however. Before that he had been out of his head a good deal. One night he got up really desperate, and Mr. Chester was watching with him. He called me. I went up. He was fairly raving. I tried to get him to bed, but I could not do anything with him. He said we had all joined in with that little German dancing-master to disgrace him, and he was perfectly ready to leave the world. But it did not last but a short time before he went to bed, and he was apparently quiet. I understood him, by that expression, to mean Dr. Bessels. The doctor was there at the time, I think.

Question. Did the doctor say anything?

Answer. No, sir. He tried to pacify him, as the rest of us did, whenever he got in that way. I would not be sure that the doctor was in there. I know Mr. Chester was, and I really think the doctor was. I am nearly certain of it.

Question. What did you think was the matter with him?

Answer. I thought it was a bilious attack that first occasioned it. I thought I had seen him in the same way before, and doctored him accordingly. We were up in those latitudes together twenty-seven months before.

Question. Had you seen him out of his head before?

Answer. No, sir; the way he was taken first is what I refer to.

Question. Did you take all these charges and sayings of his to be the expressions of a man in his right mind, or the expressions of a crazy man?

Answer. Of a crazy man.

Question. Was the effect that they made upon you at the time the effect of a man in delirium?

Answer. Yes, sir.

Question. Was that the impression they produced upon you?

Answer. Yes, sir.

Question. What was the impression which you understood at the time they produced upon the other people?

Answer. I think it must have been the same to all those who heard it.

Question. Did anything occur at that time, which came to your observation in any way, which induced you to believe that anybody was trying to poison him or trying to injure him in any way or shape?

Answer. Well, sir, I don't think there was, only the doctor came to me one night and says, "Captain Hall is quite unwell, and won't take anything." I said, "Can't you get him to take something?" and says I, "Doctor, mix up a dose more than you want him to take, and if he sees me take some of it, he will take it then without any difficulty." The doctor said, "It will not do for you to take the first drop of quinine." That's all the remark I heard. And he said once to me that he thought Captain Hall was a physician, but he knew then he was not? Says I, "How do you know that?" "Well," he says, "he didn't know that quinine could be injected into the system." That's about all I heard. He spoke once saying that he had a very strong constitution, &c.

Question. You were present when Captain Hall died?

Answer. Yes, sir. I was called when he was quite bad, and I stopped there. It was only a very few minutes before he died. I was up the biggest part of the afternoon and evening, when he was lying there. He was entirely insensible from about 9 o'clock in the forenoon until he died, about 2 o'clock the next morning.

Question. Was he breathing very hard?

Answer. Yes, sir. Sort of snorting through the nose. His eyes were very glassy. After he died he looked very natural, indeed. He was buried on the 10th of the same month, in the day-time. We took advantage of what little light there was. He died at about 2 o'clock on the morning of the 8th.

Soon after Captain Hall's death Dr. Bessels drew up this document which I now produce, and which is signed by myself and him, dated at Thank God Harbor, November 13, 1871.

(The document is now marked "No. 3, B," and reads as follows:)

"*Consultation.*

"THANK GOD HARBOR,
"*November* 13, 1871.

"First consultation held between Messrs. S. O. Buddington and E. Bessels. Through the mournful death of our noble commander, we feel compelled to put into effect the orders given us by the Department, viz:

"'Mr. Buddington shall, in case of your death or disability, continue as the sailing and ice master, and control and direct the movements of

the vessel; and Dr. Bessels shall, in such case, continue as the chief of the scientific department, directing all sledge journeys and scientific operations. In the possible contingency of their non-concurrence as to the course to be pursued, then Mr. Buddington shall assume the sole charge and command, and return with the expedition to the United States with all possible dispatch.'

"It is our honest intention to honor our dear flag, and to hoist her on the most northern part of the earth, to complete the enterprise upon which the eyes of the whole civilized world are raised, and to do all in our power to reach our proposed goal.

(Signed) "S. O. BUDDINGTON.
(Signed) "EMILE BESSELS."

He was buried about a third of a mile south of where the observatory stood. We put up a head-board and fixed the grave up as well as we could. (Producing envelope.) Here is a piece of the willow which came from it. We planted a willow shrub there; it was doing very well when I took that from it, the last time when we were there, the day before we left. We left on the 12th day of August, 1872, about nine months after his death. After his death we went on regularly, and I followed his instructions as near as I could and as long as I could. The scientific men kept on with their observations, and two men from the crew were taking note of the tide. Everything went on regularly until the latter part of the month of November, when the ship broke out and went alongside of the berg, and we made fast to it during the gale. After the gale was over, and left the ice free a little, we got somewhat clear of it a little distance from the berg, and I let her lay. We sawed the ice clear from her some distance from the berg, and the reason I did not take her any further from the berg was that in case we broke out again I wanted it to hold on to. This was a large berg grounded there in from 12 to 13 fathoms of water, the same berg which Captain Hall had called the "Providence Iceberg," and under the lee of which we had made our harbor. A few days after I had sawed her clear, the very last of the month, there was a heavy southwest gale, and the pressure of ice on the outside of the berg drove it afoul of the ship. The ship lay on the northeast side of the berg, between the berg and a little bend of the coast. Thank God Harbor was made by a little bend in the coast-line, with the berg on the outside, the bend of the coast on the northeast side of the berg. The southeast gale pressed the berg in against us, and the tongue of the berg ran under the ship about 40 feet from forward to aft. That pressed her inshore through the ice, and piled it up astern and inside of her, and doubled the ice under. As it broke down it would run under her, and piled up very high. The tongue of this berg when it went under her wrenched her awfully, and it also started the stem. The shoving of her in through that heavy ice wrenched the stem so that you could hear everything crack; every timber, especially forward, appeared to be giving way. It wrenched her very badly; I could not get her clear. I was over on the ice a great deal of the time when it was pressing her in, until it got so that the water made in the gangway, and I got a board through that and sta d there until the berg stopped coming. Afterward I took a look around the ship, and I saw it was impossible to saw her out. She had got to go astern about 40 feet, and the ice was piled high up there. Really, if the ice had not broken astern of us, I do not know how we should have got away. We had to lay on there during the winter. Every low tide, the full and change of the moon, that inshore ice would lift, and the

berg being grounded, gave her a keel of about two feet during the lowest part of the tide, and when it was up she would be on an even keel; that, of course, wrenched and strained her very badly. The stem was broken that night I spoke of; that is, I judged so from the crack; it was an old crack when I saw it; I found it first myself. We remained there in that way during the winter, carrying on the observations and doing whatever was necessary to be done. Herman Siemans and Robert Kruger, I think, were taking tidal observations part of the time. The others were doing whatever there was necessary to do on board the ship; everything appeared to be going on very well.

On the 21st of February, I received this letter and inclosure from Dr. Bessels.

The letter is here marked "No. 4, B," and reads as follows:

"WINTER QUARTERS,
("*Latitude* 81° 38′ *North*, *Longitude* 61° 44′ *West*,) *February* 21, 1872.

"SIR: As, with the return of the sun, the further operations of the expedition must be begun, and as, in regard to all these, a consultation between us should take place, I forward herewith to you the sketch of a plan by means of which, as I think, we may best fulfill the mission upon which we are sent.

"Very respectfully,
(Signed)
"EMIL BESSELS.
"Captain S. O. BUDDINGTON,
"*United States Steamer Polaris.*"

The inclosure, entitled sketch of plan of operations, is now marked "No. 5, B," and reads as follows:

"As matters stand now there are two ways of accomplishing the object of the expedition; either by boats and the vessel herself, or, as at first proposed, by sledges. Let us, now, consider both ways and the plan of operations for each that seems to offer the most advantages.

"The setting-out of a boat-party will, of course, depend entirely upon the area of open water and the improbability of new ice being formed that would interfere with its navigation. Perhaps, the party could start during the last of March or in the beginning of April—that is to be seen—if the vessel does not break out before that time, which may occur at any time, as our anchorage does not give us much protection.

"If the journey toward the north should be made by means of a boat, considerable time must elapse before it can be safely begun, and the question arises how to employ that time to the best advantage.

"As the object of the expedition is a geographical one, and as geography consists not merely in laying down a coast-line, as many may think, but requires much more than that, a sledge-party should be formed, provisioned for twenty days, to penetrate into the interior of the country, to discover if it consists of an ice-plateau, as is supposed by some, but which does not seem probable, or, in a word, to investigate its configuration. This would also give an opportunity for answering some important questions contained in the instructions.

"Another party could, at the same time, go to Cape Constitution, to determine astronomically the position of Morton's furthest point, which, in regard to longitude, ought to be verified. Besides that, these points of the coast-line should be connected with the survey of our anchorage.

"Regarding the matter of verifying positions, it will also be very desirable to send a party to Grinnell Land, the coast-line of which, although

changed a good deal by Dr. Hayes, does not seem to be correct, and ought to be resurveyed. Besides that the party could, perhaps, find out if the land contained any glaciers, as Dr. Hayes stated.

"There is no doubt that it would be considered as a very valuable geographical discovery to determine how far Grinnell Land extends from east to west, which might be done by ascending some of the high mountains near its coast. It must be confessed that this party would be subject to many difficulties and much risk, even if open water did not impede their progress, because the ice is rough and hummocky, and liable at any moment to go adrift.

("As matters stand since the day before yesterday, it would be impossible to cross the strait. February 21, 1872.)

"It is not impossible that the ice in the southern part of the straits will be better for traveling purposes, so that the Cape Constitution party might cross with comparatively little difficulty, but if you take into consideration how much trouble it cost Dr. Hayes, who crossed the strait twice, how it enervated his party, it seems better to give up this plan, especially because next summer there would be very likely a more convenient way of reaching Grinnell Land.

"As it has been concerted, the Polaris will leave at her anchorage a depot of provisions and a boat. Should the vessel be compelled to leave her anchorage before the sledge parties return, then the party arriving first at Polaris Bay should wait for the other, and upon its arrival proceed to Newman's Bay, (the only harbor we know of toward the north,) in the most expeditious manner. By all means it would be a good plan if the vessel breaks out before the return of the sledge parties to leave also a boat with a patent log and provisions at Newman's Bay, because the boat left at Polaris Bay would be used to carry the united sledge parties, and there should be another to fall back upon, in case of accident.

"If the vessel should drift south during the absence of the parties, then documents of the further route they intend to take will be found a few feet to the west of the present site of the observatory. The spot may be known by the iron bar which now holds the pendulum-case.

"Let us return, after this digression, to consider a plan for the operations of a boat party toward the north. One of the smaller boats should be taken, with as many provisions as possible, the necessary instruments, and small stores. The party should follow up the eastern side of the strait, surveying the land and making such investigations in hydrography, in regard to currents, sea atmosphere, and soundings, as may be made without too much delay.

"As near each full degree of latitude as possible the party will build a cairn, and deposit a record of its proceedings, in order that the vessel, if necessary, may know where to search for it.

"Should we, notwithstanding the favorable prospect we now have, be compelled to use sledges on the journey toward the north, then we should start as soon as possible, by all means by the middle of March, because it is not probable that then the temperature will be much lower than it is now, although we might have more gales.

"It cannot be denied that it is a great advantage to use dogs for draught, provided sufficient game can be procured on the way for their food, but as we are compelled to travel over a poor country and make large distances the dogs will prove hindrances rather than help. We must, then, as the English expeditions have done, almost exclusively use men for draught. Two dog-sledges should be taken, loaded with

four small sleds, the provisions belonging to them, and besides provisions for the whole party for thirty days. Should the two sledges meet with many difficulties in advancing, which will very likely be the case, then they will establish, at places they may find favorable, small depots of provisions for their return, stay as long as possible with their small sleds, and return when circumstances require it. Then the small sleds will be loaded with the undiminished provisions, and each man drag his own sled, a total weight of two hundred pounds.

"By no means can the small sleds expect to return by the same way over the ice, because at that time it will be broken up, and the vessel herself under way for a high latitude.

"As has been mentioned in the case of the boat party, the sledge party will also build cairns and deposit records of their proceedings.

"Having arrived on their return at a place from which they are unable to travel any further south, they will keep up a continued watch, and signalize, by flags and smoke, while the vessel fires a gun several times a day.

"Now, a few remarks upon the operations of the vessel. It would undoubtedly be best to use as little as possible of our coal, and to proceed north by sail. If it is possible for the vessel to advance along the coast of Grinnell Land it would be profitable to do so, on account of the running survey that could be made, as there certainly will be some one on on board who can conduct a work of this kind.

"The determination of the local attraction of the compass before the vessel starts should not be neglected as heretofore, because without this an able survey cannot be made.

"It should be considered as a matter of the highest importance to take deep-sea soundings, or soundings in general, whenever practicable; for, except those made by John Ross in 1818, there are but a few taken by Inglefield, and two by Kane. If the time will not allow of more, one sounding a day would be valuable, and should be taken.

"If the water is not very deep one of the smaller sledges should be used to procure a larger number of specimens than can be obtained by the apparatus of Brooks.

(Signed) "EMIL BESSELS.

"*Winter Quarters, Latitude* 81° 38′ *North; Longitude* 61° 44′ *West.*

"FEBRUARY 10, 1872."

On the 29th of February I sent to Dr. Bessels the following reply, which was written by Mr. Meyer from my dictation. This is a copy in Mr. Meyer's handwriting. The same was here marked "No. 6, B," and reads as follows:

"THANK GOD HARBOR,
"*February* 29, 1872.

"SIR: I have carefully examined the contents of your communication dated Thank God Harbor, February 10, 1872, and your suggestions as to an early trip to Cape Constitution and the inland meet with my entire approval. Anything to the furtherance of science which can be done before the starting of the final expedition to the north, in pursuit of the principal object of this expedition, I would decidedly advise you to undertake, and you may be assured that all possible aid on my part shall be given to you and your undertaking. The expedition to the north will, within all probability, proceed by the aid of boats; and it is my decided intention in such a case to take command of the boat party. To come to any conclusion as yet in regard to the details of this

boat journey and the proceedings of the ship appears to be useless, inasmuch as circumstances will generally govern our actions.

"Very respectfully, yours,

(Signed) "S. O. BUDDINGTON,

"*Commanding United States Steamer Polaris.*

"To Dr. EMIL BESSELS,

"*Chief of the Scientific Party of the North Polar Expedition.*"

What I meant to refer to in saying I would take charge of the boat party myself, was to put such men into the party as I thought proper.

Secretary ROBESON. You say here you meant to take command yourself?

Answer. Yes, sir. What I meant by that was to put Mr. Chester and Mr. Tyson into those boats to take charge of them, as I had nobody else. The instructions which I gave to them are in the journal.

Question. What you meant, then, was that you would take command of their organization and direct their proceedings?

Answer. Yes, sir. The orders I gave that boat party are pasted in the journal. After this the doctor made a sledge journey to the south, and got back not far from the 8th April. Mr. Bryan went with him, with Joe and Hans. A sled broke down, and Mr. Bryan and Joe came back and repaired their sledge, and left the doctor and Hans down there, and then they went back again; when the doctor came back he was nearly snow-blind; they were gone a fortnight. I had but very little to say about the sledge-journeys, as we had come to the understanding that the doctor was to have charge of those and the scientific operations. But I kept everything prepared, and even had the small sleds and big sleds made for him. I got everything as near ready as I could, and kept the dogs in good order and condition. I didn't see much prospect of the sledges going north, and I proposed a sledge journey to Dr. Bessels for Joe and Bryan; they were very anxious to go; they were really the best ones, as I considered. I proposed it to Dr. Bessels, and he asked if I had said anything to Mr. Bryan about it; I really equivocated a little; I didn't like to say no or yes, for I had spoken to Bryan about it. But, however, I got over it in some way without telling a very bad falsehood, and then he told me that he would speak to Mr. Bryan about it. It went along, I think, for a day or two. I asked Mr. Bryan every once in awhile, and sometimes twice a day, if the doctor had said anything to him, and he told me he hadn't. One evening Mr. Bryan spoke to him and told him he was all ready to start in the morning, and wanted to know if he had every preparation made, &c. The doctor rather resented it, and, I thought, made use of some language that was not called for. I heard it from below, and went up into the cabin, and the doctor said he wanted two sleds immediately. I said, "All right, doctor; when do you want them?" He said the first fair day. I said, "All right," and then I went and told Joe and Mr. Bryan that it was no use for me to try and do any more; that the doctor had charge of the sledge journeys, and wanted one or two sledges, and I gave up then undertaking to do anything about it. I took the boats from the shore alongside of the ship the 1st day of April. Dr. Bessels sent off Mr. Meyer and Mr. Tyson, as I understood, on a musk-ox hunt. But still he was going in the boats when they were ready. The Esquimaux went too, and Meyer went along under Bessels's instructions, and was gone some time. I believe his report, rendered to me when he returned, is somewhere in the papers. They were gone quite a while, and, as I understood, reached the latitude of 82° 9′. When they came back I asked Captain Tyson why he didn't go further, as

they had killed twelve musk-ox during the cruise among them, and had plenty of dog-food and whatever they chose to have from the ship. He said he was out of fuel. I asked Meyer why he didn't go further, and he said that he went as far as he wanted to; that he didn't choose to go any further.

On the 1st of April we took the boats from the shore alongside of the ship on the ice, and Mr. Chester went to work on his to fix it to suit himself. Captain Tyson, with the carpenter, went to work on his. There were two four-oared boats. They got them in perfect order to suit themselves for the expedition, and I supposed and understood from the others that we should have to make such a journey, or undertake it, if at all, with boats. The sledding was then wearing away very fast. The snow was going from the land, and it would be bare in a very short time if they didn't take advantage of the spring. They fixed them up and were ready. I told them to have them ready by the 1st of May, and they would have been ready. They had every convenience that could be got up, even boxes for the chronometers, a sounding-line of 2,500 fathoms on each boat, reeled up on the stern and all rigged for that purpose. Somewhere after the 1st of June we sledded those boats up to Cape Lupton. I can't exactly recollect the dates. Mr. Chester started first, and got a short distance, when he unfortunately lost his boat, with nearly everything in it. The ice ran over him in the tide-way. It was no fault of his. He was doing as he thought best, and as well as any man could do under the circumstances. He came back to the ship, and Captain Tyson got an opening after that, and got up as far as Newman's Bay before Mr. Chester overtook him. Mr. Chester got back to the ship and rigged the canvas-boat and started again. We could not spare the other two boats in case they might be lost. After Mr. Chester left that time I heard no more from them for some time.

The ice broke on the outside of the berg, and I found that my saw which I had made here could not work. I cut one of the saws over that day, rigged derricks, and went to sawing three or four days and nights as long as we could stand it, and sawed the ship out clear of the berg and got under way immediately. I supposed the boats had got some ways north, and I wanted to overtake them if possible.

We had a very heavy gale of wind. The ice came up; there was no going any further, and I could not have used steam; if I had I would not have done much better, the gale was so heavy; I carried sail very hard and got her up some distance; the pack was forming and the gale still continuing; I ran back under the berg waiting for a better chance. I made three faithful trials and found I could not get any further north. I only used steam once. After the first trial up, two of the men came back from Newman's Bay after some provisions—Herman Siemans and Robert Kruger. Then I sent Hans away with a note to Mr. Chester, advising him to come aboard, as, if there was no chance to get north, we might save some fuel, and I thought then we could get north under the circumstances as quickly as the boats could. But he could not get aboard with the boats, and he sent back word to me to send him back the men. Finally, the doctor came back with Hans and staid aboard after that for some reason or another. I don't know why he came back. I wrote to Mr. Chester, as I say, to that effect, that I thought he had better come aboard and we would try to pump the ship, and, if there was an opening to get north, we would go. He sent word back by Hans that he wished I would send one of his men back at any rate, that it would be some time before he could get down, the way the ice was. I sent them back with what provisions they could carry, and sent him

another letter, telling him how the ship was situated, and if he saw a chance to go; I should recommend him to go by all means, or something to that effect. After that I heard no more from them, but they came scattering back. Tyson came first after landing his boat on shore. I left it to their option to do after that as they thought proper. They went away the 8th of June, I think. Mr. Chester left the ship at that time, and he got back somewhere about the 22d of July. They were gone from a month to six weeks. He and Herman Siemans were the last to come back. They staid to get their boat ashore. She was on the ice when the others left her.

Question. What did you do then after they came back?

Answer. I really could do nothing; there was no chance to get the ship away. Mr. Chester came back about the 22d of July, and I never got a chance to get away from there. We had good lookouts from the top of the hill every day, and somebody was up there with the glasses. Hans was my main dependence for that. He was very faithful and trustworthy, reporting the ice, and even took pains to draw a chart of where the water and ice was while he was there. I found that I could not stay another winter, with what coal we had, and a leaky ship, and I spoke to Dr. Bessels to give it to me in writing. It was his opinion that we had better come home, as it was mine, and I wanted to have it in writing, but he put it off, and I finally didn't say much more to him, or nothing more. We sawed her out clear of the berg, and started on the 27th June to go north. I had to work pretty hard sawing. My hands were so blistered that I could not hold on to the ropes. Every man was at work on board except the second engineer, who was attending to the donkey-pump. When I was out there I had no seamen aboard, with the exception of Morton, and one other to steer. That was the cook; the others didn't know anything about it. I did all I could to get the ship north, but failed. When we were trying to get north the first time under sail, we had the wind right down northeast. The southerly winds, as soon as it breezed up at all, would set the ice into Polaris Bay, so that it was impossible to get out of it at all. The northeast winds opened the ice most where we were, but they drew right down this channel above us. Where we lay they drew off the land, and as you came to Cape Lupton the ice was tight. Laying in Polaris Bay you would see the ice outside of you, and anybody would naturally suppose you could go up, but the ice swept by the point so that the boats could not get down. It was so close to the shore from Newman's Bay I could not get up. I thought I saw we should never do much more there by staying there another winter in taking observations, and one year was about enough, as I considered, to take what observations we could there. I didn't see that I could get any further north.

After the whole of the boat-crews got aboard, which was about the 22d July, Mr. Chester and Herman Siemans being the last, we did nothing but watch the ice for a chance to get out. Before they came, it took me all the time to keep her afloat. She was jammed ashore four or five times. After they came, I had men enough to man the pumps with proper reliefs, and then I waited my chance to get out. On the 12th of August we started. We steamed down to that little island marked on the chart, near the west shore, and there we stopped for a short time, and drifted through between the two islands that you see on the chart, and after getting through a little ways, we got another lead and worked down to where we were finally beset. My orders to the officer on deck were to work in to the

westward with every lead they could find; but they were too favorable to the eastward, and we could not find any lead to the westward; every lead appeared to favor a little more to the eastward. We either had to stop in our progress or take those leads; but everybody was anxious to get along, and, finally, we came to a block about 12 o'clock of the 15th of August. I think it was in the latitude of 80° 2′. We made several trials to get her in-shore from there, but without success. Every time I tried, it cost me some 4 or 5 tons of coal, and I saw the thing was impossible to get her away from there. She finally froze in. We drifted gradually through the month of September and averaged a mile or two a day. After we got down toward the straits further, we took a faster drift, and, finally, drifted to the southward of Cape Alexander. We were somewhat south of that when the heavy gale took us which parted us. We were anchored to the floe with the best hawsers we had, fore and aft. We were beset at the floe, I think, the night of the 15th of August. We made a few trials and got a lead west from there, but nothing to speak of. From the night of the 15th August until the night of the 15th October we were fast to the floe. We had put up a tent on the ice, and framed it up by mortising into the ice, and got it covered with the awning. We landed some bread and things we could spare, in case we all went adrift from the ship, and had everything else on deck ready; whips were all on the yard; the boats both on that side; and we made every preparation we could, really, to land on the floe. We had a sail drawn under the ship's bows, tight under her keel—a piece of this awning—and picked all the old rope into oakum and shoved down through there, and took ashes from the galley and put it on top. But in these nips she got; she tore all clear of the bows and left her leaking badly, and it took the stem, from where it was cracked in the first winter, clear out entirely. All that was gone. If she had not been an uncommonly good ship she would have sunk right there; but the lining inside kept her afloat. She got some very heavy pressures that night. She was very strong in the bow, but was not exactly the right shape. Where the crack was she was two feet through as far aft as the crack run. She was almost as strong as a ship could be made and stood as much, I suppose, as any ship could stand; she stood more than most of them would. Few ships would have stood the pressure she did that night without going down immediately.

We had drifted down below Cape Alexander that time, and I thought the ship was going clear and would come down Baffin's Bay, as the party did on the ice, and then get out in the spring all right and everything safe. I felt encouraged when we got to the south of Cape Alexander, and I am certain we should have done it if we had not got that heavy gale of wind from the southwest. At that time I had drifted the whole way down Smith's Sound, coming through the straits in that tideway and getting down in the north water among the bergs there. I knew we had the water to contend with, more or less. We generally do have every year. Then we took this heavy gale of wind. It had been blowing about twenty-four hours before the 15th. About 6 o'clock on the evening of the 15th of October it was blowing and snowing very thick. They reported to me in the cabin that the ice had cracked on her starboard side—the side opposite the big piece that we had our house on. I went out and found that it had opened then about two feet from her side and was setting off very fast. As the wind was very near aft, I had an extra warp put out aft and hauled the one forward tight. Soon afterward she got a heavy pressure that came up on her starboard side and heeled her over to port so that the rail was nearly onto the ice.

Then it was reported to me by Mr. Schuman, the engineer, and Captain Tyson, that she was making water very fast, and I ordered them to get the provisions and other things onto the ice immediately, which they did, and carried them back as fast as they could. I hurried them up to get them back from the edge of the ice. There was one point astern of us that had some on it and I was afraid it would crack off, as it did. Some of the men were on the ice and some on the ship. They were on the ice a greater part of the time. I noticed when the ship was getting a heavy pressure of ice grinding her there would be more on the ice than aboard, and when she slacked up there would be more aboard. Mr. Chester worked very hard, and so did everybody else. Not far from 10 o'clock I looked and saw one of the aft anchors had jammed out, and the cleets aft that I had used for the purpose of making the hawsers fast to were torn off, and both hawsers were made fast to the mainmast. I saw one of the ice-hooks was out on the floe, and I sent a man to cut another hole to put it in and another one onto the house to slack up that hawser that was fast to that hook. While I was looking at him cutting the hole I saw the ice had cracked on the point where he was putting in the hook. I turned again and looked forward and saw that the whole stem, where the warps were fast, was gone. That is to say, I saw that the ice to which the stem was fastened had broken off so that she was loose at the stem from the floe. I cast my eye forward and saw that the warp was gone, and before I could say anything we were all gone—that is, the whole ship was loose. A boat lay across the crack and one man said, "What shall we do with it?" I said, "Haul her out on the high hummocks;" and that was all I could say to them. We were out in the darkness in a minute. I tried to get a light up, but I could not keep a light in the ship at all, it was blowing so hard. We flew away there for quite awhile. I could see the ice to leeward going as fast as we were. Our propeller-wheel was full of ice, frozen solid, jammed up. The machinery was all frozen, too. We had no water in the big boiler and no fire under the small one. The fire was built under, but the water was not hot. The engineer came and said that we would have to do something; that the water was getting into the fires as fast as possible. We rigged the pumps on deck by turning warm water into them out of the boiler. They started easily. We had been pumping with the bilge-pump and had kept free with that for a number of days. We got the deck-pumps rigged and all hands got to pumping. We hove blubber and pine doors and everything of that kind in to get steam up. We kept the big pumps going. We could not get the water off the decks. The scuppers were all frozen, and the water was above our knees at the pumps before it would go out of the ports. We could not keep the scuppers clear on account of the snow and ice on deck. We managed to keep the water from the fires finally and got the steam up and the steam-pumps going, and then we kept her free during the night. We were drifting then to the northeast, until in the morning, when it became nearly calm and the gale nearly died away. When we parted from the ice we must have been about abreast of Littleton Island. As near as I could tell, I thought I recognized a berg that we went very close to, fast to this floe that lay there all winter. Littleton Island is above Cumberland Island, about sixty miles, I think. Before the snow set in I could just see Northumberland Island—just before it was going to snow. That was two days before we separated. I think it was on the 13th. I could just see Northumberland Island in the morning; then we drove back before the wind with that gale until we were nearly abreast of Littleton Island, I should judge.

After we went adrift we drifted right into the northeast as long as the breeze lasted. In the morning I unbent the foresail before daylight. It was a square foresail. I set the men all to making bags before daylight to get out the coal from below, so that we might use it if we had to go on the ice. We had no other canvas. As it became light I saw we were north of Littleton Island about three miles, and about three miles from the shore, or not far from that. There was no lead when daylight came. I could not spare coal to get steam on in the big boiler, and I thought at one time it was best to take some of the rigging off the mast, there being more than we wanted, and get the fire started in that way and then burn some coal. I had just decided, knowing I had to work quickly as we were slowly drifting off shore, when the wind came to the northeast and the ice began to slack right in the direction we wanted to go and no other. I got sail on and got a little steam on the small boiler. We would get a three-minute turn before the steam would run out, and I worried her inshore. We got her within about twice the ship's length of the shore, I should say, or perhaps a little less. We came to the shore-ice as she took the bottom. The ice was frozen to the shore. It was the top of high water and the full of the moon. At low water she was hard and fast and fell over on her side as far as she could go. Next day we took a look at her bows and found it was impossible to do anything with her under the circumstances; and we saw it was too far along then to repair her, if we had had the means, and could have got her to a proper place even.

We took our spars and sails ashore and went to work at the house, landed all the provisions and everything that was in her pretty much, and made her fast and solid where she lay. We had great help from the Esquimaux in doing this with their sleds and dogs. Next morning after we got there, two came. They worked all day. They came from Etah, about six miles off, on the mainland. I really don't know how they come to discover us first. The first I saw was early in the morning; they were hallooing, and they came off and proved to be some of Dr. Kane's acquaintances. I set them right to work and they worked faithfully, and went back again and promised to bring the rest. I told them to bring all the men there was there. According to what I had heard of them I thought they would not come. I paid them very well, and the next morning seven came with six sleds; they worked faithfully as long as we stopped there and as long as we wanted them sledding the things ashore. We got ashore on the shore-ice; it was grounded where the ship took the bottom. That point was the only place along there—I believe about the only place where we could have got anything on the beach. When the gale died away the next morning, after we broke adrift, we used our sails. We only used the steam for pumping, and what little we could spare to help her around a point or through a streak of light ice or something of that kind. We had no water in the big boiler at all and had no steam on except from the small one, and we got some help on that to help her along. Sometimes we would cut through a point of ice where it was light. It took us from the time we got started until 4 o'clock in the afternoon to get in there, about three miles. I think we started about 9 o'clock.

Question. Could you recognize the floe at all from which you had broken adrift?

Answer. No, sir; I had the best lookouts at the mast-head, Mr. Chester and Henry Hobby; they could not see anything even with the best glasses in the ship. I had them up at daylight looking for the men; they could not see them. They thought they saw some provisions on the ice, but

they could not tell. We kept a regular lookout for them but never saw them. When we started to come down we thought we were about three miles north of Littleton's Island and about three miles from the shore. We came down under sail with what little assistance we could get from the steam with the small boiler and went in about two miles north of Littleton's Island, at a point known as Lifeboat Cove, of Dr. Kane's. Our vessel grounded about twenty rods from the beach, and just there we reached the ice and were able to get ashore by the shore-ice.

Question. At the time you turned in toward shore there you had these lookouts at the mast-head?

Answer. Yes, sir; Mr. Chester was aloft nearly the whole time from the time we started in, after we got started first, until we got ashore.

Question. You did not see these men nor any signs of them?

Answer. No, sir.

Question. How was the atmosphere?

Answer. Quite clear, that day.

Question. No wind?

Answer. It breezed up in the afternoon quite strong; northeast.

Secretary ROBESON. About what time did you make the shore?

Answer. Not far from 4 o'clock; it was just getting night in that latitude. I judge that was the hour; I didn't look, but I think I have heard them say it was about 4 o'clock. I had considerable other things to think of at that time instead of looking.

Question. If you had seen the men could you have got to them in the ship?

Answer. Never, sir. It was all she could do to get ashore. If we had been out another night I don't know what the result would have been, though we had a moon and perhaps could have worked somewhere. We might have got to a heavy floe. The ice we were in then was not fit to land anything on. We had either to get to a heavy floe and get onto it, or else get to the shore, or the ship would sink. We couldn't pump her to keep her afloat; she would have sunk in a very short time.

Question. Had any of the Esquimaux seen the men on the ice at all?

Answer. No, sir. I inquired of every party that came. I thought they might get ashore to the south of us, and then, by the aid of the Esquimaux, I should have found out and got them. I made particular inquiry of every party which I found out came from Cape York, or near there and up to where we were, and I came to the conclusion the party was not on that shore at all, and that possibly they might be picked up on the other shore, as McClintock and De Haven had drifted down there, and swept close into Cape Walsingham. Whalers generally have done so. When Chester thought he saw the provisions on the ice, it was to the southward of us. Whether he was mistaken or not I cannot say. I thought there would be dogs, and he would see them running about. I asked him if he saw any, and he said he did not. There must have been some dogs there on this piece where the provisions were; possibly there might not have been any, but the last I saw nearly all the dogs were on the ice.

Question. How high was that ice above the level of the sea, that they were on?

Answer. I should think the highest part may have been fifty feet.

Question. Did Chester see this piece with the provisions on it in the morning?

Answer. Yes, sir.

Question. Were there any high hummocks or peaks of ice between you and where this was?

Answer. Yes, sir; to the south of us appeared to be all ice. Down for a little ways it would appear to be completely tight; as near as he could tell, it seemed a firm pack. There were a great many bergs grounded, and some hummocky ice. Bergs were very plentiful.

Question. How high are these hummocks?

Answer. Some would be from twenty to fifty or a hundred feet high. There were some very high places on the floe the men were on, and some very low. Where the house was, it was between two heavy ridges.

Question. Was there any refraction in the atmosphere that morning?

Answer. I think not, sir; it appeared to be a very clear morning.

Question. How far were you from shore, according to your estimate, when you broke loose from the ice?

Answer. Really I couldn't tell, but I shouldn't think we were but a short distance from Littleton's Island, by the bergs. When it came morning I could not see any bergs any distance from Littleton's Island off-shore. Chester thought he recognized a berg we were close to that night, and one or two others, and I think I did while we were drifting fast to this floe. We passed very close to it. Then a few minutes after we broke adrift we were by a large berg, very close; so I should say we were quite close into Littleton's Island when we broke adrift. Hans, once before we went adrift, thought he saw the land close to us, but I think it was a berg.

Question. How do you account for not seeing the people on the ice?

Answer. Really I cannot say, sir. The lookouts, I am sure, did the best they could to see them, and how it was I do not know. I shall never be able to tell, unless they were behind some hummock or some berg. If they saw us, however, we ought surely to have seen them.

Question. You think if you had seen them you could not have reached them?

Answer. No, sir; we would not have been able to have got to them. I supposed, with the boats and everything of that kind, that they would have been able to have got to us better than we could get to them. I saw one of the men in New York, and he said that the pack-ice was so bad that they could not get away, though they tried to. But I really could not get that ship where they could not get with a whale-boat. If I should have got steam on and tried to steam to them I should have torn her all to pieces, and then perhaps never got more than half way to them. I asked the second engineer that day how much coal it would take to get steam under the big boiler. He said nearly all. We found that there was from five to six tons when we got it out of the bunker.

When I ran the ship on shore two miles north of Littleton Island at Lifeboat Cove, she took the bottom just about the time she took the shore-ice, so that we had direct communication with the shore. We commenced immediately to hoist out the coal below that remained there and getting the stores ashore. We took down the sails and spars to make a house, and Mr. Chester commenced on the house with some assistance, and I commenced getting the coal, provisions, and other articles ashore and made the ship fast and solid where she lay to the grounded ice on the shore with heavy hawsers and cables. After that we drove ahead as fast as we could and finally got everything arranged for the winter. Got a galley-stove and cook-stove on deck and took the cook-stove ashore. This was the only low place along there. It so happened that we got in there at the only place we could have got in. There we lived very comfortably through the winter.

It was twenty-four hours or thirty-six hours before we saw the natives. Only two made their appearance at first. I set them to work that day, the second after we reached shore. They worked all day, and at night when they went home I paid them for their services with knives and files, and I gave them a couple of sword-bayonets. Next morning they brought in seven natives and six dog-sleds and they all went to work then. We got everything of every character out of the ship. We took all the coal, all the provisions, all the implements, and all the records that I knew of, on shore. The records were in a box. There were a few of them that were not taken ashore at that time, but they were taken ashore during the winter. The ice held firm all winter. We were about twenty rods from the shore. I think we were about four days at it, from the time we began, in getting the things on shore. Meanwhile the house had been built of spars and bulk-heads of the rooms below torn out of the ship; we used the ceilings in the rooms below. The spars were laid on and covered with sails, double. We were fourteen, all told. We then made arrangements for the scientific operations, and some two or three men went over to Etah on a hunting excursion to try to get some deer; that is an Esquimaux settlement, about six miles from where we were, and I believe it is the most northern one on the coast. There are a few houses only there, but nobody inhabited them while we were there. We had flour, bread, Indian meal, some oatmeal, some potatoes, canned meats, salted meats, and dried apples. We had a good supply, but the only thing we had more than we needed was dried apples and potatoes. A great deal of provisions had been lost overboard at the breaking of the ice, I suppose, though I don't know how much. It was all put on the ice; I suppose some one put it there, but I did not see it. I never saw much of any that was lost. It was afloat on the ice the last I saw. There was a great deal put overboard from the ship at night, and when the ship broke away some of it broke apart. The part that was aft broke away.

I have got a list of very near the whole of what was put on the ice here; (presenting a list;) the list was entitled as follows: "The following is a list of provisions and articles put upon the ice before the ship broke away, as near as I can come to it." This list is written by Joseph Mauch, the man who acted as clerk, and written out at my dictation soon after we got on the shore. I had a pretty good run of all the provisions, and I took down a list of them, as near as I could tell by what was left.—(The list above referred to was marked by the secretary "*No.* 7, *B.*") There was none of the pemmican left; it was all put on the ice.

The next day after we grounded, Mr. Chester, myself, and several others, and, I believe, the doctor, examined the ship; also Mr. Bryan, and I do not know but they all did; but both Mr. Chester and I made an official examination to see the condition she was in. Her stem was gone from the 6-foot mark down about as low as we could see, and the wood ends torn off and a good many of them broke. The 6-foot mark is six feet from the bottom of the keel, up. It is the 6-foot draught mark; from that point the whole front part of the ship was gone. The planks were sprung out; the hole was not through, if it had been she would have sunk immediately, of course, but the ship was lined inside; that and the timbers kept her afloat. The space was clear down as far as we could see, about three feet; that was entirely gone and showed what must be below from what was above. The wood ends of the plank had sprung out from the stem. The stem below was broken and gone; we lost that part of our stem the night of the nip, the 15th of October; the stem had been broken before. We had sails on the bow, and oakum was shoved

in between the sails; that was all carried away by the storm. She got a heavy pressure from the ice, and one of the seamen told me at the time that the stem must be gone. Some considerable damage was done there before the 15th of October.

Part of it was gone the last we saw of it before that, which was when we were getting the sail on the bows; perhaps from the 1st of October to the latter part of September; I don't recollect exactly. She had not got pressure between that time and the night we parted on the ice. I suppose the stem went that night. The ship did not get nipped after she had broken loose from the ice that night. She drifted and came up to light ice after that, and the wind died away shortly afterward. I could not see any means of keeping her afloat under the circumstances. I think if we had had coal, and any kind of clear weather, we might have managed to pump her out and have got her afloat and taken her somewhere else, perhaps, where we might have fixed her; but under the circumstances we could not get anywhere else, and we could not fix her there. We had one small boiler, with an engine, aboard ship, which we used for pumping, which would burn about as much coal as a small stove. We could not keep her free without using steam. The night we went adrift we were pumping as hard as we could, and were just able to keep her up long enough to keep the water out of the fire until we got steam up under the small boiler.

I did not hold any formal survey over the ship to see if she were sea-worthy, under the circumstances, as the ice laid around her so that we could not; she was frozen clear round so that there was no chance to examine her at all. After the first day she was really in a condition where we could not do anything; we could not have done anything more with her, under the circumstances; we had only from five to six tons of coal; we could not any more than have got steam up with that; we went into winter-quarters; we did not have any consultation previous to that as to what to do; we did all that was left to do. It was everybody's opinion to do then what we did do. The coal that we took ashore we used as fuel. We had one small stove and another cook-stove besides. The scientific operations were carried on during the winter. Hourly observations were taken nearly all the time with the thermometer and barometer and as to the velocity of the wind.

I think it was four nights I staid aboard after we got the ship ashore, while we were taking the things out. The ship's crew staid ashore one night before I went there. The ship at low water was very much on one side, and we could not stay aboard very well, and went ashore at once. We got some fresh meat during the winter from the natives. I believe we never got any hares or rabbits in the fall at all. Two or three parties went out, but were unsuccessful. They got several foxes during the winter around the house. We got no more musk-oxen; there were none down there at all. We got one reindeer in the spring, and several rabbits, large white hares. We got no fish. We got some large seals from the natives, and several parts of seals. The natives visited us during the winter from Etah and below. I think they came from the lower settlements toward Cape York. I think all the men, at any rate, that were there that winter, and the biggest part of the women, came to see us. I have got a list of something like a hundred who were there. That list is in the journal. They did not speak English. There was a family from across on the west side came from down where the whalers had been. I could converse with them understandingly, and they interpreted to us. I could not converse with the Cape York natives at all. This family from the west side staid with

us all the winter. The family consisted of a man, wife, and two children. The man went a good deal to hunt. I don't know whether he got anything much. They did not know Joe. They came from farther north than he did. We staid there until the 3d day of June. We had intended to leave the first, but that was Sunday. Monday it blew too hard. Tuesday we left. I informed the whole party that I wanted to be ready to leave the 1st of June, and we made that arrangement. We commenced building boats in April. The coldest month we had there was February; that is, I think the thermometer ranged the lowest that month. It began to moderate about April. There were some mild days in March, but very few. The boats were built of the ceilings of the cabin. By the ceilings I mean the inside walls, the stanchions, &c. Mr. Chester conducted the boat-building; the carpenter and John Booth helped him, and some of the rest—Mr. Odell and others. The boats were 25 feet long, and 5 feet beam amidships, and flat-bottomed. They had no keel. We used masts and sails. They sailed very well with fair wind.

Nothing notable happened during the winter, other than I have detailed, that I recollect. We kept a log that contains a general summary of everything that happened. We left Lifeboat Cove on the 3d day of June. Our idea for leaving so early was to get to the whalers. I never expected to get any farther than Cape York to meet the whalers. I knew they always came that way and had for years. We came pretty near being too late for them as it was. Seven had gone down before we got there, and there were only three others. It is the custom of whalers to follow up the fast ice through Melville Bay by Cape York on the east side; and sometimes they have to go to the north of the Carey Islands, and then cross over the west side to the mouth of Lancaster Sound. We expected to catch them as they went up on the east side. We had a very passable sort of a time, and got down there very slowly but surely. We stopped at Hackluyt Island, which is off Northumberland Island; from there we got on to Northumberland Island and stopped one or two nights. After leaving that island we came across to Cape Parry and came along the east shore, across the sound to Cape Parry, and worked along that shore. The next move we made we got down to Cape Walsingham. We stopped at Dalrymple Island, adjoining Walsingham. From there we got across to Conical Rock. That is still farther down on the east side toward Cape York—I suppose about fifteen or twenty miles north from it. We stopped there two nights and not far from two days before we got started again. Then we were on the ice until the 23d of June, and then we raised this ship about twelve miles off. We were then about twenty-five miles south of Cape York. There was a good deal of ice between us and Cape York. The fast ice was in here. We did not try to get in. We made a straight course along the fast ice from Cape York. We did not put in because I was aware that the ships kept the fast ice alongside of them, knowing that the ships always kept the fast ice, and coming up till they got so they could cross over to the westward. We raised this ship about twelve miles off, and soon after seeing her we saw men coming toward us on the ice from her. They had seen us first. We had hauled up our boats on the ice, coming to a stop, and went into encampment there, waiting for an opening, when we raised this ship, and soon after saw these men coming. She was twelve miles off, we considered it. The men took what they could, and we took what we could, and we left the boats and went to her. We called it twelve miles; it was a pretty tough way to go. We were very kindly received aboard the Ravenscraig and taken across. She got relieved on the 4th of July from where she was, and got out into the sailing

water, and crossed over to Lancaster Sound with both steam and sail. The Ravenscraig was a bark of about 400 tons, with steam-power, commanded by Captain William Allen, from Dundee. The ship hailed from Kirkcaldie, but sailed from Dundee. When we got over to Lancaster Sound, we fell in with the Arctic. After the first seven men had gone aboard the Arctic the rest remained at that time aboard the Ravenscraig. A short time afterward we fell in with the Intrepid, another bark with steam-power, Captain Seuter, also from Dundee. Three of our men, Mr. Bryan, John Booth, and Mauch, went on board of her. The Ravenscraig had poor accommodations for so many men, and we were afraid the provisions would not hold out, and that is the reason they had to be provided for otherwise.

On the 20th of August following, the Arctic had completed her cruise. She had a very successful one and was ready to go home; and these men who were left on board of the Ravenscraig were taken on board of her. We sailed on the 1st of September, and reached Dundee, I think, on the 18th, but I am not positive. We left the Intrepid off Cape Clyde, I think, or very near there. She was whaling; she lacked very little at the time of being ready to sail. I expected as soon as she could get another whale she would be going home. There were two other ships beside the Intrepid there that would bring the men home. The Eric only lacked one whale of being ready, and the Intrepid about the same. I never spoke to the men on the Intrepid after I went on board the the Arctic. She was in sight all the time; she was not in any dangerous position at all; all the danger of the voyage was supposed to be entirely over. The Clyde is nearly opposite Discoe on the map, on the western shore. The whaler would remain north of Cape Walsingham until the middle of October; then they will probably be carried down to Dundee by the Intrepid. When we parted with them they were all in good health. Mr. Booth was fireman. Mauch acted as clerk. Captain Hall took him for that purpose; and he did all the writing I had to do afterward. We arrived at Dundee on the 18th; then we were taken care of by the United States consul there and supplied with everything we needed. We went from Dundee to Liverpool, and from Liverpool sailed in the City of Antwerp.

I have a journal—here it is; there are several places there to which I wish to call your attention. (The journal is produced, entitled, "The journal of S. O. Buddington; written by J. B. Mauch, from the death of the commander, Captain C. F. Hall, to the arrival on board of the S. S. Ravenscraig, at Kirkcaldie.") This journal was commenced after Captain Hall's death. Some of the first part of it was copied from another one that was kept during his sickness. It was written day by day as the events happened. The part of it that refers to the boat's cruise after we left our winter-quarters at Lifeboat Cove was written in pencil, and afterward copied into this book. The ship's log was kept by Mr. Chester. It was kept originally in the regular form in the regular log-books. There were two of them. They are now up at Lifeboat Cove, in a water-proof package, wrapped in oil-cloth, and put away in a cairn. We did not bring them with us on account of the size. They were copied into one smaller journal by Mr. Chester during the winter. This is a copy of the whole of the log of the Polaris from the time she left until she grounded at Lifeboat Cove. I believe it is all Mr. Chester's writing.

Mr. Meyer kept Captain Hall's journal up to Disco, I believe, or up to winter quarters. He wrote very little in it himself at Disco. During his sickness he read to me what he had written, between spells.

Mr. Meyer kept it until we got into winter-quarters in Polaris Bay, and after that he took it himself. He kept his journal in a large book. He had three of them. It was put in a large japanned tin box, with all his private papers and all his books of every description, locked up, and set in one of the cupboards in the cabin. I never knew it was gone until we were adrift; that was gone and everything else there, or nearly so. It was there until we were putting the things out on the ice. Mr. Bryan and Mr. Meyer cleared out the cabin; which of them put it over I don't know. It could not be found when we were adrift; it was put on the ice. Mr. Bryan will know how that was as he put it over. There was a writing-desk, besides; that went too. I don't rightly know what that had in it. I had locked it up. Joe once asked me on the voyage what it had in it; I told him that was something that would have to be settled after we got home. All of Captain Hall's papers were kept in this box with the exception of what might have been in the writing-desk. It was quite a heavy box, and it was quite full of books; the books of ship's accounts were all in there, all his private letters and all his journals of every kind that were aboard, except what was in the desk. They were all missing that night; they were put on the ice, I suppose. I did not see it done, but they were gone. At the time he died his papers were in the room where he did his writing. I saw them there after his death. There were several lying out on a table he had there. He had a small room where he used to do his writing. Several of his papers were piled up under the table. There was no examination made of his papers after his death. They were all put in this box at once, after his death, or a very few days afterwards. Joseph Mauch and Mr. Morton had had charge of all his papers before that.

Question. Were any of his papers burned?

Answer. At one time during his sickness we were having a talk together about one thing and another. He said he had written a letter to me and took it out. This was after he read his journal to me. He said he had written a letter to me, and he thought I had better not see it; but if I insisted, he would show it to me. I told him it didn't make any odds. He then said he thought it ought to be burned, as he did not approve of it, and he held it to the candle and burned it. I never knew what was in it. He said he thought I had better not see it, and therefore he burned it. This was between his first and last sickness, and during his lucid intervals. No other part of the journal, or anything else, was burned at any time, to my knowledge. Nearly all of his loose papers were put in the box immediately after his death.

Question. Was his journal read about the ship?

Answer. It was read by Mr. Chester. He asked me to look at it, and I let him have it. I only looked at one statement that Mr. Meyer put in. He read the whole of it to me. The captain had mentioned it to me that Meyer had written it and that he didn't approve of it exactly. All the papers were in the box—every one that I knew of—all his papers of every kind. The small books, I think, (seven in number,) that he brought home with him from the sledge-journey, he gave to his clerk to copy. He was in the act of doing that during Captain Hall's sickness, and it was finished after his death. These contained notes of his whole survey. This is the copy of the seven small books above mentioned. It purports to be a "true copy from the original of Captain Hall's last sledge-party to the north." After Captain Hall's death his clerk had charge of the books, with orders to copy them. He finally had charge of them all the winter we were ashore, and last winter he copied them. They were kept separate from Captain Hall's other papers. Finally six of them

were put into a chest where his other books are up there. This one I brought along. There were no other papers left there that were written on the voyage that I know of. If there is any other writing up there I am not aware of it, with the exception of the log-books. There was no formal examination made of Captain Hall's books, papers, and effects after his death. Nobody was appointed to examine them and seal them up, or anything of that kind. The clerk had had charge of them, and had stored them in the box. I never troubled them in any shape or form. I never had occasion to refer to anything, and when I did anything of that kind I generally spoke to him about it, as he knew all about them. All his papers of every kind, except these small books, were put in that box shortly after his death, and remained so until they were put on the ice. I don't think it had been opened for several months. The key was among a lot of keys. I think Hannah had the whole of them. She had control of the keys and about everything Captain Hall had. Whenever I wanted anything out of the trunk I would go to her for it. I found the bundle of keys and gave them to Captain McRitchie, who has them. I never heard of anything being burned except this letter that I spoke of. I don't know what the letter contained. I never saw it. It was at his own option that he did it.

Question. I want to call your attention to the time of Captain Hall's death, and I want to get a distinct expression from you. Have you any reason to believe that Captain Hall died anything but a natural death?

Answer. I really have not.

Question. Did you ever think that he died anything but a natural death?

Answer. I thought there was something very strange about it. I could not believe but what he did die a natural death; but once in awhile, in thinking it over, I thought there was something that appeared rather singular to me; but I have told before what I thought.

Question. Did you ever have any real reason for suspicion? If so, state it.

Answer. No, sir.

Question. Did you ever hear him accuse anybody of poisoning him except when he was delirious?

Answer. No, sir, I think not; and then he accused almost everybody, though he appeared to speak more against the doctor than any one else. We had a very good crew. The mate, the second mate, the seamen, engineers, firemen, cook, and steward did their duty faithfully. I never want to see any better men. I had no occasion to complain of them in any shape whatever after Captain Hall's death or before.

Question. Did you have occasion to complain of anybody else?

Answer. Yes, sir; somewhat.

Question. Let us hear all about it.

Answer. Captain Tyson. He was a man that was rather useless aboard, and complained bitterly about the management generally. He did not appear to be satisfied with anything that was done. I would consult him on a subject and he would perhaps agree to it, and then afterward would say that he thought it was no use to do anything of that kind; that he knew it was of no use. He generally acted in that way. I got so after a while that I did not pay much attention to him. I advised with him very little after awhile. Dr. Bessels and I did not agree very well. Really I could not give any reasons more than I have given in my journal. I proposed a sledge-journey in the summer during the month of May, and got defeated in it entirely. We disagreed on several points in regard to carpenter-work. I believe that was about

the whole of it. However, we got along very peaceably, and had no trouble to speak of. We had no outbreaks of any kind.

Question. Was there any disagreement after Captain Hall's death between you and Dr. Bessels about what should be done?

Answer. Not particularly so. It was agreed he should go on with the scientific operations, and that I should take charge of the ship. I assisted him in every way I could in his scientific operations. I had everything done that it was possible to do. He never wanted anything but what was attended to immediately. The discipline of the ship was very good. I had no difficulty whatever with the officers and crew that belonged to the ship. It was not so good as it was before Captain Hall's death. It was felt that discipline would naturally have to relax a little under such circumstances. That is the way I was situated. But there never was any work that ought to have been done but was done readily.

Question. Did you have any difficulty at any time with Captain Hall?

Answer. Yes, sir; twice. We got under way from St. John's about 4 o'clock in the afternoon, just outside of the heads, and by some means or other the steward went ashore and gave the keys of the locker, where the tea and other things were stowed in the passage-way, to Captain Hall, or laid them in his room, and we were under way coming out just outside of the heads a short distance, the decks all lumbered up, and getting the anchors onto the bows, and the steward came to me and said, "We will have to break open the locker and get the tea for supper, as we have no tea out." I said, "What is the matter with the tea?" He said he could not find the keys. There was a common staple stuck into the locker. It was not clinched. I did not think what I was doing, nor that there was any harm in it, and drew it out with a marlin-spike, and let the clasp off. Captain Hall felt very much offended at it, and gave me quite a lecture in regard to it. I apologized the best way I could, and finally it was all settled. The next difficulty was occasioned by an unfortunate remark of mine. It was a remark that was very foolish and uncalled for, but it was not intended for his hearing. It was made while in winter-quarters at Polaris Bay. Mr. Chester and Mr. Morton and Captain Tyson and myself had taken a glass of whisky that Captain Hall gave us that morning. We went on deck, and there an argument arose in regard to sledge-journeys. I got rather excited in the argument. I suppose the rest were somewhat excited. Mr. Chester appeared to be somewhat so too, but I cannot say as to that. He is aboard here now. Hays was sweeping off the decks at the time. I will state that Captain Hall had given me orders to save all the chips and shavings that might be around the decks. I went down into the corner of the house and Captain Hall was up over my head. I did not know that he was anywhere about, and I said to Hays, "Save all these shavings and put them in a barrel and they will do—— I might use the expression——

The SECRETARY. Give the expression, if you please.

WITNESS. The expression I made use of was, "They will do for the devilish fools on the sledge-journey." I had no idea Captain Hall was about, and I was thunder-struck when I saw him. That was the only time I ever touched him; it touched him in a very tender point. The remark was not intended for him at all; it was a very useless remark and I was very sorry for it; that was all. It was about the worst thing I could have said in his case, as he was very much in favor of sledge-journeys.

Question. Was there ever any chance to get north with the ship after she got beset in Robeson Channel?

Answer. No, sir; none that I know of.

Question. Was there a consultation there by Captain Hall with Chester, Tyson, and yourself?

Answer. Not with me; I never heard of any.

Question. With anybody?

Answer. No, sir; not that I know of. There was something said after we got into Polaris Bay about the chance to get north. Captain Hall stepped up to the hill himself and looked at the ice and came back and decided that it was impossible. He never asked me about going further at all, but told me that to end the thing he would make that his winter-quarters.

Question. When you first were stopped, and before you floated down to your winter-quarters, was there any lead into the westward?

Answer. We could not find any; we tried, however. That is the way we got beset, in trying to get across to the west side. Once when Captain Hall and Mr. Chester were on a floe, the ice opened a little; we had not steam on then, and if we had had I could not have left without him and without his orders to do so. I think we could have got around that floe, but before they got back again the opening was closed so we could not start over there.

No conversation occurred in which Chester and Tyson expressed a desire to go north while I expressed a disinclination to do so. I never so expressed myself. I have seen that report printed in the papers, but it is not correct. No man in that ship would ever so express himself to Captain Hall and get along with him. I think I should be the last one to undertake to say anything of that kind. I did my very best to get the ship north. I never said anything about never going any further north. I never said that whoever wanted to go north might go, but I would not. I never made use of that expression in my life. I never said so to Captain Hall nor I think to anybody else on board that ship. Captain Hall was a man who would not hear such a phrase uttered by any one such as I have seen reported to have been said. I never expressed myself as being relieved when Captain Hall died. I never made use of such an expression; I thought right the reverse, and I think so still, that I got into more trouble through his death and had a great deal more to contend with twice over than if he had lived. I did make one remark after his death. I was aggravated about something, and I said, while speaking about Captain Hall's death—I do not know how it was brought in—I said, he has got me into a fine scrape and has left me in it. That is all the remark I have any recollection of making after his death regarding his decease. It was very careless in me to make such a remark, but I was a little irritated about something that was going on at the time. I meant by that remark that I had now the whole responsibility of trying to get through with the enterprise the best way I could.

Question. Did you ever say to Henry Hobby, or any one else, "Henry, there's a stone off my heart?"

Answer. I do not recollect of ever saying such a thing, and I do not think I did. I am sure I never did.

Question. While speaking of Captain Hall's death, I mean.

Answer. Yes, sir; I understand. But I never did make use of such an expression. If I did it was foreign to what I felt.

Question. Did you ever say, regarding the journal, or any part of it,

that you were glad it was burned or destroyed, as part of it would have been unfavorable to you?

Answer. Never. I never said anything of that kind. All that I ever spoke about was that letter that he burned, to Mr. Chester and Mr. Tyson, and what Captain Hall said when he burned it. There might have been other persons present when I mentioned it to these gentlemen. I do not know how that was. I do not know what was in the letter. I said that he had burned it up and that there might have been something in it against me, or must have been. I do not know what it was; but by the remark he made I thought there must have been something in it that referred to the remark that I had made and which I have repeated here. There was nothing else that I knew of that it could possibly have referred to. If I had not mentioned its destruction to any one, I do not think that any one would have known anything about it. There might have possibly been an Esquimaux man or woman present at the time it took place; but I do not recollect anybody having been in there.

Question. Did you ever have any difficulty with the doctor?

Answer. Only once; I had a few words with him upon one occasion. I had been taking something to drink, and he said something to me regarding it. I just took him by the collar, and told him to mind his own business. That is all the difficulty I ever had with him; that is, openly. That was coming down out of Kennedy Channel, after we had started to come home. It was about taking something to drink; that is all. I went to the aft hatch to get something to drink. He was down there at the time and made some remarks about it. I do not remember what he said, exactly; it was alcohol reduced that I was drinking; alcohol and water, I suppose.

Question. Was not the alcohol put on board for scientific purposes?

Answer. Yes, sir.

Question. What did you drink that for?

Answer. I was sick and down-hearted, and had a bad cold, and I wanted some stimulant—that is, I thought I did; I do not suppose I really did.

Question. Was there any other kind of liquor on board?

Answer. No, sir; not that I know of.

Question. Were you in the habit of drinking alcohol?

Answer. No, sir.

Question. How did it get into the after cabin?

Answer. It was brought up from the fore-peak.

Question. Is that where it was kept?

Answer. It may have been kept in other places.

Question. How was it brought up?

Answer. By myself. There was a half-pint bottle or pint bottle full; I cannot tell which. It was a very small bottle.

Question. Are you in the habit of drinking?

Answer. I make it a practice to drink but very little. I did take too much twice during this voyage, that I remember: once the latter part of April, and on the occasion I have just referred to. When I so indulged in the latter part of April, it was when we were in winter-quarters. The ship was not moving then. The other time was the night that the ships got beset, coming down Kennedy Channel, the same night that I had the difficulty with the doctor; we were tied fast to the floe. I did not consider, however, that I was not in a condition to do my duty. I merely felt the liquor. I do not think a stranger would have seen it on me at all. I had drank occasionally before, but not to any excess.

The liquors that went on board the ship were under Captain Hall's charge during his life-time, and I had the keys after his death. They were in the magazine. They consisted of wine, whisky, and, I believe, some brandy. I think there was a box of brandy there—alcohol, the last winter, four cans. I took two of them; the other I do not know what the doctor did with. The two I took were taken out onto the ice and their heads knocked in with a pick-ax. That was during last winter, after we had got ashore. We had those four cans left when we got ashore. I do not think it was colder at Polaris Bay than at Lifeboat Cove. There was a great deal more wind in the first winter-quarters, heavier gales than in the last. In the last there was a steady breeze, but no very heavy gales. In the first quarters there were some calm days, but the wind blew very heavily most of the time. There were musk-ox, a few foxes, hares, and lemings at Polaris Bay. There were Brant geese there in summer, the king-duck, a few snipes around the shores, and several land-birds and snow-birds; there were also some gulls. We saw no deer up there. Where we made our second winter-quarters there were deer instead of musk-ox, and more foxes. We found rabbits, also. We saw very few rabbits until we got farther south. When we got there, there were more than we had ever seen before. We saw them on the hill-sides everywhere, and down at Sorfalick, and every island we went to. The men went around there and found them very plentiful in the spring. At Polaris Bay there were some flowers, sorrel, willow, and stunted grass; and finally we raised wheat there. I got it to growing. The head got out of the barrel and some was spilled on the ground, and before we left there it had sprung up two or three inches. This was during the summer. The summer began there about the 1st of June. There were some mild and very pleasant days in May. It began to get very well settled about the 1st of June. The ice did not make as a general thing at that time. It used to make occasionally in very calm days, but it generally went away when the sun came. The aurora borealis was very faint; there was more in the southern portion than there was farther up. We saw shooting-stars very often at our second winter-quarters in the spring. While we were in the boats we saw very few seals out; but we never got a shot at one all the way down that I know of. Our provisions held out well, and even if we had not seen the ship that rescued us I think we could have worked down to Upernavik. I have no reason to doubt it. I think we would have gotten there in about a month or two longer; perhaps in a shorter time. There were two whale-ships still to come, and we might have met the Tigress or the Juniata going up there. This was the 23d of June. I felt confident at the time that we should get down all right. We hadn't heard anything about our comrades that were left on the ice, until we got on the Ravenscraig. None of the natives knew anything about them. I inquired of every one who came to us all the winter through, and no one knew anything about them.

The people on board the Ravenscraig had heard of it at Disco. These papers that came in that box from England are all the papers that were preserved that I know of, except what Dr. Bessels might have. Mr. Bryan and Joseph Mauch have a journal themselves. I believe they lost the astronomical records of the first winter. I think Mr. Bryan said he had none. He lost his journal up to that time on the ice, but Mr. Mauch's journal, I believe, is entire from the beginning; we did not leave any records lying about in the house that I am aware of; nothing that was valuable, at least; we wrapped up all of Captain Hall's printed books and put them into a large chest; also everything that I could

find that was valuable; the most valuable books were put into a large chest and put away. The logs were put into another cairn on the hill; Mr. Chester put them away in a box and tied them up; I had them tied up and had an oil canvas wrapped around them, and then they were buried in the cairn. The books put into the chest were several charts and books of Captain Hall—printed books, his Arctic works, principally; these were put in a chest and set back one side, with orders to the natives to deliver them up if a ship came; we took away everything we could carry with us in the boats; all the papers and records were carefully preserved; when we left our boats there were several things left on the ice; nothing of this kind, but some of the men's clothing and some cans of meat that we could not carry to the ship.

Question. If you had had the Polaris in good condition would this have been a good summer to have gone on north, as far as you could judge from the appearance of the ice?

Answer. Yes, sir; we could have gotten up Smith's Sound, when we left there, about fifteen miles; the ice went clear across there then.

Question. Have you any means of judging whether you would have been able to get farther north than you got the first year, if you had been able to remain?

Answer. No, sir.

Question. Would Newman's Harbor have been a better place for you to winter than Thank God Harbor?

Answer. Yes, sir.

Question. Would you choose that place if you were going again—if you had to seek winter-quarters in that neighborhood?

Answer. Yes, sir; if I could not get on the west side.

Question. Would you rather winter on the west side?

Answer. I should prefer that.

Question. Why?

Answer. Because there would be a better chance to get north from that side, as far as I know. The land stretches somewhat farther north when you get on that side.

Question. You would choose the western shore to work up on?

Answer. Not with the ship but with sleds. With the ship I would take the east side. The tide sweeps strongly down the west side of this channel and crosses down through Lady Franklin's Bay, and there appears to be heavier ice than there is on the other. The current runs south nearly always; at the turn of the tide we would have a slight set to the northward for perhaps a half an hour or so, as near as my recollection goes, then it would start to the southward again; and sometimes it would not start again to the northward, but would slack and then start off south immediately, or very soon afterward.

Question. In the mid-channel does it ever run to the north?

Answer. Very slightly, sir, as far as I know. I never saw it.

Question. Did you ever have any northerly current after you were out upon Cape Alexander and drifted back to Littleton's Island?

Answer. I never perceived any. It was the force of the wind that drifted us.

Question. Did you discover there any tidal wave from the Pacific? Do you know anything about that?

Answer. I could not say, but I have my doubts about it. This sketch of our journey, north by Mr. Meyer, is tolerably accurate. There are several of the islands off Cape Buckner and Cape George Back that are not correctly placed. Mr. Meyer and the doctor are capable of making a correct chart of the cruise. I don't know who else unless Mr. Bryan.

As we went up Captain Hall said he recognized Cape Constitution. I did not pay much attention to that; I was on the lookout ahead. He spoke to me one day about Cape Constitution, and pointed in that direction. I paid but little attention to it. When we passed Cape Constitution we saw the land all the way up on both sides when it was clear. We had some fogs in 81° 20′. When we passed along here where Kane's open polar sea was laid down we found it to be a sound instead of an open polar sea. The land stretches up a little to the eastward of north above Cape Constitution. The chart of Kane and Hayes is incorrect so far as the position of Cape Constitution is concerned and the lay of the land. The latitude I did not pay particular attention to find out whether it was correct or not. When we were going up Robeson Straits we saw land on both sides about Cape Lieber when it was clear. I think a person being at Cape Lieber could see the land on the other side of the straits. I saw it in the dark days during the winter. I could see land across Cape Lieber and from off the ice.

The straits there I should not call one inch over thirty miles. The degrees of longitude up there are about nine miles. At Cape Lieber, with weather clear enough to see Cape Union on the east coast, it would be impossible not to see the east coast unless there was fog there. I saw Cape Union from the Polaris several times. I saw it every time I undertook to go north. Its position is correctly laid down on the chart, I think. All this land laid down on this chart north of Cape Constitution, up to Repulse Harbor on the east, is a new contribution to geography. I have never seen it down on any chart before. It covers the place laid down in Kane's chart as the open polar sea without any land there at all. I thought I also saw land to the north of Hall's Land, northeast from Repulse Harbor, not laid down on Mr. Meyer's chart. I could not be positive, but I felt sure I saw it to the north, from the northern point made by the Polaris, for I saw the land on the western shore a long distance above Cape Union. I don't think I saw it as far as 84°. I saw beyond Cape Union; that is all. I think Cape Union, from the Polaris's farthest point, was somewhat further from us than what is laid down in Mr. Meyer's chart here. It was not sufficiently clear up there to get an observation. I do not know what is the depth of water in Newman's Bay. In wintering there I would expect to lie at anchor on the north side. I did not go up there myself. I only saw it when I went up with the ship. I never left the ship. Captain Hall said when he went up there and came back that it was his belief that we ought to have been in, and wished we were there. He told me so. I do not know whether he told any one else so or not. He said he wished we were there then. We would have been more likely to have been frozen in there, but we would have been some thirty or forty miles farther north. I think that from the records and the logs that have been preserved, Mr. Meyer, Dr. Bessels, and Mr. Bryan can complete an accurate chart. I have been in those waters a great deal, and have had a great deal of experience in those high latitudes. I consider it possible that the Pole can be reached by this route; but in getting a ship through this channel that is now laid down and back again I think will be a difficult undertaking in some seasons. In some seasons you might get the vessel through so as to get up here on the west shore somewhere and get a harbor, and I think that by proper management you might possibly reach a very high latitude and possibly get to the Pole. I do not think it should be attempted with one ship alone; I should recommend at least three. Place one down upon Littleton's Island, perhaps above, and another one on the western shore as far north as I could get it, into

a safe place; with the third I would proceed on as far as possible, having these two to fall back on as a means of escape. With the third ship I would push north, without looking behind, and be prepared to abandon her up there; I should hardly expect to get her out again. A powerful steamer, with good sailing qualities, is what I would prefer. She ought to be a ship of about 130 feet long at least and 450 or 500 tons, on account of carrying sufficient coal. She ought to be 28 or 29 feet of beam; something like the Tigress—I have never seen the Tigress, but I know pretty well what she is—or like the Arctic for instance. If the Arctic were stronger she would be a splendid ship for such a purpose. I refer to Captain Adams's vessel, the one that we came home in. She is a wooden ship, about what would be needed, but it would need of course to strengthen her; she has great power as a steamer. The temperature of the water at Polaris Bay was about 29 in the summer. That was the highest it got, I think. I do not recollect ever hearing of its being 30. I did not pay much attention, however, to that part. Whenever I made any inquiry about it the response was that it was 28 or 29. It would freeze over night when the sun was low. At Lifeboat Cove the character of the bottom where the ship lay was rocky, and between the rocks we would find a little mud, but that was all. It was all a rocky bottom the first winter. As far as I know, the bottom was very soft and muddy. Once in a while there was a large rock. Right where we lay there were very few rocks. I saw the bottom all the way off from the ship a great many times as we were paddling off in clear water. There was some little grass-weed on the bottom, but very little. When we were in our boats and making our escape from Lifeboat Cove I could never tell whether we were helped much or not by the current. We either had a fair wind and were going under sail or else pulling. We pulled with six oars, such as they were, but we did not meet any current against us. If there had been very much of a tide we would have known it.

Examination of Hubbard C. Chester.

My name is Hubbard C. Chester. I am thirty-six years of age. I was first mate of the Polaris. I have been a whaler by profession. I had been in the waters of Hudson's and Behring's Straits before I went on the Polaris expedition. I had never been up to Baffin's Bay before. I went on the Monticello, that took Captain Hall up into Hudson's Bay. I was mate of the Monticello. That was in 1865. Captain Edward Chappel commanded the vessel. I then came home and went round the Pacific. I had made one voyage before with the same men and in the same ship. I went round Cape Horn in the Monticello. I was in Behring's Straits one season. The next season I was mate of the Peru. The next year I was mate of the Daniel Webster, of New Bedford, and the following year of the bark Eagle, also of New Bedford. They were all whalers. In the spring of 1870 I came home from there; from the Sandwich Islands to San Francisco, across the continent to New York, and I think it was the latter part of August, 1870, that I engaged in the expedition with Captain Hall. Captain Hall was looking around for a captain. Captain Chappel was the man who came on here and assisted him in selecting a vessel, &c. He is the man who expected to go. The reason, I believe, that he did not go was on account of his asking too large a salary. After Captain Buddington came home, Captain Hall decided to take

him. I sailed with the Polaris from Washington, at this navy-yard, when she went out; from New York on the 29th of June, and New London on the 31st of July. We arrived at St. John's on the 11th of July, I think, and left the 19th. From thence we went to Fiskernaes, where we arrived the 27th of July; thence to Holsteinberg; thence to Disco on the 4th day of August; thence to Upernavik the 21st; thence to Tessuisak, which place we left on the 23d of August. From there we made no stops. We went on from Tessuisak up Baffin's Bay, skirting west of Northumberland Island, up through Smith's Straits into Smith's Sound, keeping over toward the westward and coming up north off Cape Napoleon. We made nearly a straight line across from Cairn Point to Cape Hayes. We met ice off below Cape Hayes and Smith's Sound. We then put to the westward in order to get round the ice, and steered for Cape Hayes. We kept on up, and landed near Cape Hayes. Captain Hall and myself went in a boat to examine the bay and see if it would make a good harbor for the ship in case we were obliged to put back on account of meeting with ice. From that point we kept close to the westward coast. We passed by Cape Constitution and passed through Kennedy's Channel into what was formerly called "Kane's Open Sea." We steamed through that. We saw the land on both sides. We passed Lady Franklin's Bay. We were on the east coast, and passed Lady Franklin's Bay on the west. We passed up through the narrow channel, about fifteen miles wide, which is now called Robeson Channel. In going from Disco up there we were from the 23d to the 31st of August. On the 31st day of August we made our farthest point north. It was pretty well through Robeson Channel—about the center of the channel. Captain Hall told me at that time that he made it 82° 26′. I believe it was afterward ascertained by Mr. Meyers to be 82° 16′. After we passed Cape Frazier we met no ice, steering through open water. I forget the night or the day of the month it was that we passed the small island that is laid out on the chart near the western shore above Cape George Back. We passed that at night when there was a thick fog. We steamed slowly. The next morning we were off the southern cape of the south fiord, as laid down on the chart. That morning at 8 o'clock the fog let up, and we saw this land. We were so far to the east that we saw no opening to the north, and therefore supposed that we were in the bay, the land being all plain in sight. There were quite a number of altitudes taken that morning at 8 o'clock from the point where we found ourselves off the cape—the southern cape of the southern fiord. The fogs came on again, and we lay there until near noon. It then cleared up again. The vessel lay still, and we got a meridian altitude. From thence we steamed up toward the north, and we made the opening which is marked on the chart as the opening of Robeson Channel to the north. We steamed up pretty near the east shore of the channel. Captain Hall tried to land with the boat, I think, twice on the eastern shore of Robeson Channel. On the 31st day of August, 1871, we got to the highest point we made. The steamer was stopped. We could see through the channel, and there was a water-cloud seen—a dense water-cloud—to the north. I mean a cloud that denotes open water. It is a sort of fog that hangs over the water. I think we could have gone farther north from that point. It has always been my impression that we might have gone on. It was my watch below at the time. I heard them sing out to the man at the mast-head, and heard the man at the mast-head sing out there was a lead close to the land on the east shore, and some one called me. I do not recollect who it was, but some one called me and said that Captain Hall

wanted to see me on the house. I went up, and when I got there the officers were all there, and the scientific corps. The names of those who were there are Morton, Tyson, Dr. Bessels, Meyer, Mr. Bryan, and Captain Buddington. The vessel was turned round, and she was then headed to the south. Captain Hall said he wanted to get the opinion of the officers as to what it was best to do. It was the opinion of some that there wasn't any prospect of getting any farther. He didn't say so himself. He asked each one his opinion separately. The opinion of Dr. Bessels was, I think, that we had better cross the straits and try to get up on the west shore; and that was the general opinion of the whole party. If we could not get any farther on this side it was thought better to do that than to keep south after we had reached higher latitudes. The idea was, to work up on the west side of the straits; but in going across that bay, when near the middle of the channel, the vessel was likely to get beset in the ice. I did not go to the mast-head. I only know what I heard the man sing out from the mast-head; but my opinion was that we had better go on where we were—on the east shore. I don't recollect exactly what I said. I think they came to the conclusion that they could not go any farther on the east shore. Then the opinion of the party was that we should try to cross the straits and get up the west coast if possible. This was the opinion of Dr. Bessels; the opinion of Mr. Bryan, I think, was the same; that of Mr. Meyers also. I thought we should try to push up on the east side. I think I told Captain Hall that it would be better to try and push up on that side, and if we couldn't get up there, then cross and try the west side. Tyson's opinion, I think, was the same. We were in favor of going farther north if we could; if we couldn't, then to go into harbor where we were, if possible. Captain Buddington thought we could not get farther on the east coast, I believe.

The result was we pushed over toward the west shore and got beset in the ice, and drifted to the south, when we should have kept on the east shore where the ice afterward opened. We steamed in toward land on the west, and all the open water there was in the channel, was on the east side of the channel. If we had forced our way on the east shore, even if we had got beset, we would have been sooner liberated than by going into the middle of the channel, or going off on the west shore. The winds were from the northeast when we got beset and were carried down. Before we put off to the middle of the channel Captain Hall tried to make a landing on the shore.

I think that Tyson went with him at the time. That is the place he called Repulse Harbor, because he could not get on shore there. When we got beset in the ice we drifted down to the south. I think it was the third day of September when we got clear. When we got clear we steamed in toward the east coast, into Polaris Bay. It was quite an extensive bay, and what we called Thank God Harbor was formed by what Captain Hall called "Providence Iceberg," on the south side, and a little indentation on the coast on the north side. We did not try to get north at all from there that I knew of. I was at the mast-head from the time we got clear of the ice, steaming into the harbor, and I told him, Captain Hall, that there was a channel of open water along the east coast as far north as I could see.

We steamed in under this headland, and he called me down and I went ashore in the boat with him. That was the first landing. After we had landed there we came off, and we made some soundings and went in with the ship to anchor. My idea was we could have gotten up from there along that coast at that time; that is my idea. I thought I

could see from the mast-head clear open water beyond Newman's Bay. Captain Hall wanted to go north as far as he could. I could hardly tell you what prevented him from going. He was not much used to navigation, and of course he depended on some one else.

Question. What I want to know is, whether Captain Buddington was opposed to going any farther north or not?

Answer. I could not say that Captain Buddington was opposed to going farther north. I do not know that he was, but I think likely if there had been some one else there as sailing-master the ship would have gone farther north; but his idea was, I believe, that we could get no farther, and therefore the vessel was turned around. We then commenced to steam across the channel, and we got beset and were carried down. The third day of September, as I have said, we got clear, and then steamed into the east coast. We then began to land the stuff.

I think it was the next morning that Captain Hall called me on to the house. I believe Captain Tyson was there at the time. He asked us our opinion. He asked us what we thought about wintering there. We told him that we thought if there was a possibility of going up a few miles farther in the steamer that we ought to do it, and save a great deal of hard work and labor in taking things over the ice to land. I told him that every mile that we could get the steamer up so much labor would be saved. He then concluded that he would go up on to the high land bordering on the channel on the east side and have a look up the channel and see how the ice was. He started the day after. He did not get up on the high land; it was almost too long a walk, so he came back. There never was anything said after that about moving the vessel out, or moving any farther north. The stores and provisions were landed there. The observatory was built there, and we began to make the ship snug for winter.

Question. If you had had command of that ship could you have gone farther north?

Answer. I do not like to say anything of that kind. I should have tried hard to. I thought I could see considerable open water at the north. We knew by the water-cloud that there was an open sea of water there. That was evidence, because we saw all the time we were in the channel, when it was clear, this dense white cloud to the north. We knew after we got through this channel that we would be going into a large bay or sea of some kind. The best chance I saw was at the time we steamed in after we got out of the ice, when we were beset there. I think we could have gone up through the channel on the east coast, because the wind was to the northeast, and all the ice there was in the channel—was in the middle and on the west shore. Whether I could have done it I can't say, but I should have tried it if I had had the privilege. We went into winter-quarters, and on the 17th of September I went away on a sledge journey for Captain Hall. I went to the eastward; was gone seven days, accompanied by Doctor Bessels and the two natives. We went about twenty-five miles from the vessel on that journey. We got the first and only musk-ox that was got that fall. We were absent seven days. This was a hunt. We came home, and on the 10th of October Captain Hall started off on his sledge-journey. I went with him. We started with one sledge and fourteen dogs at first, and we went back from the first encampment after an extra sledge, so as to divide the load. The traveling was very bad; the snow was deep and soft, and Captain Hall, the natives, and myself had to assist in pulling the sled. We made six encampments. I think we encamped every night. We stopped in some of them on our road back some two or

three days. We built a hut every night. We went on for six days. The point that we reached was what Captain Hall called "Cape Brevoort," the north cape of Newman's Bay. We went across the bay on the ice about eighteen miles from the mouth of the bay. We did not go any higher than Cape Brevoort with the sleds. We staid there two days. We built up a cairn and buried a cylinder of records in it at Cape Brevoort, near the beach, up the bay from Cape Brevoort headlands some three miles, I think, but near the shore, where it could be seen by any one landing. We found it was impossible to go any farther overland, or go on the ice in the channel, with the sleds, but I traveled over the land from here with Captain Hall, being absent about eight and one-half hours, traveling in what twilight there was at the time. We only had twilight. We were gone eight and one half hours. We reached the highlands at what is marked down on Meyer's chart as Repulse Harbor. We crossed in that eight hours from Newman's Bay over to the high land at Repulse Harbor, and staid on this high land looking right down from the elevation. We could see the land trending off to the east, on the east shore of Robeson Channel, and turned off rather more rounding than on the Meyer's chart, and a prominent cape off to the east. The land seemed to make to the southward from there, and we could see nothing beyond that cape. On the west side we could see land stretching up, I think, sixty miles that day. It was a very clear day. We stood on high lands, at Repulse Harbor. We could see a cape far on the north, on the west coast, quite sixty miles up. Then there was a dense water-cloud that extended round in a sort of semi-circle. There were places in it lighter than others. It looked like a cloud to me. We came back to the hut, and the next day it was blowing hard, I think. We had encamped there with the intention to go up to the head of Newman's Bay and get on to high land, to see if we could see any more land to the eastward, running off to the north—at the highlands at Repulse Harbor the land was, I should think, somewhere about a thousand feet high. There were hills all along up on that side. We made up our minds that we could not go any higher on that side, and then we started to return. Captain Hall's health seemed to be first-rate. The lowest temperature, I think, that we had while we were away was twenty-three degrees below zero. We were four days in coming home, I think. In returning, we came more on a straight course. When we went, we traveled up the bay, in a ravine most of the way up.

When we reached home, Captain Hall was in good health apparently. When we arrived we saw all hands belonging to the ship. They were banking her in. I went below to clean up, and to look out for our sleeping-bags, and I think we had been in about an hour some one came down into the lower cabin, and said "Captain Hall was sick." I lived in the lower cabin with Captain Buddington, Tyson, Odell, the second engineer, Mr. Morton, and Joe and his family. Captain Hall, Schumann, Mr. Meyer, Dr. Bessels, the cook and steward lived in the upper cabin. The temperature was pretty warm inside the ship. When we went in there that day it was about sixty-five or seventy. I think they kept it up in the cabin about the same, for the order from Captain Hall was to keep the cabins at about sixty-five. I do not remember who it was told me Captain Hall was sick, nor can I remember what they said; some one came into the room and said he was sick, but gave no particular description of the sickness. I went up to see him, I think, somewhere about half past 6 o'clock in the evening. He was lying in his berth. I asked him how he was; he said he felt pretty sick. I think he told me that it was a change of food. He had been eating pemmican, and

raw, fat pork, which had disarranged his stomach. He did not say what was the character of his sickness; nor did he say particularly that he had been sick at his stomach. I staid only a few moments with him. I do not know whether it was that evening or the next morning that the doctor told me that his left arm and left side were paralyzed. The next day he appeared to be about the same, I think. The day after he was a little better. I do not know anything about his side being paralyzed. He did not say anything to me about it. Neither did I hear coffee mentioned. In fact, he did not say anything about his sickness; and I know nothing about it, further than what I learned from Dr. Bessels. I do not think I saw him until the next day, when he appeared a little better, I think. That was the third day. He was up and down from that time until, I think, the 6th of November, when he became insensible. I was watching with him that night myself. He appeared to be better than I had seen him when he lay down; but he soon got to breathing pretty hard while he was asleep. I had to call the doctor at such a time; and, it being near the time, I called him, and told him that the captain was breathing pretty hard; and I did not know but what he ought to be waked up. I asked the doctor about it. He said it was all right, and started out as quick as he could to the observatory. He had not been gone but a few minutes before Captain Hall raised up in his berth, and I saw he could not speak. His tongue was swelled. He tried to mutter out something, and I ran out on deck, and one of the men happened to be on the ice taking the tide observations. I sent him right to the observatory for the doctor. I do not know whether the captain spoke after that or not. I have heard that he was quite well; and the next day he was speaking to Captain Buddington and Dr. Bessels, or some one. That I do not know anything about. I never heard him speak. I was watching with him that night before he went to bed. I had been with him before he went to bed about an hour. He seemed to be quite well. Did not take any medicine of any kind that night. I do not think he took any that day at all. I was with him an hour before he went to bed, and he seemed quite well, and took no medicine, and nobody else had been with him; but he went to bed and waked up in this condition that I speak of. There was nothing given to him from the time he appeared quite well until after the time he appeared worse. No medicine was given him, or anything of that kind, that I saw. I was with him every night. The night was divided between Mr. Morton and myself. He was out of his head considerable of the time; indeed, most of the time delirious. He appeared to be suspicious. He was afraid some one wanted to injure him in some way. He was afraid to take medicine of any kind. He was afraid also to eat anything for fear some one wanted to poison him. That was when he was delirious. I never heard him accuse anybody of trying to poison him when I thought he was in his right mind. He accused everybody, I guess, that was in the cabin. I think he accused me. He appeared to be suspicious. If I poured him out a glass of anything, he would want me to taste it first. I did so, but it did not poison me. He thought somebody had guns in the berth there, and he spoke at times of a blue flame he saw coming out of my mouth and the mouths of two or three more persons who were in the cabin. He thought it was poisonous. He thought he saw it coming out of Tyson's mouth, too. He saw it on my coat. He would feel me all over, and try to rub it off.

The doctor attended to him pretty closely. He seemed to do everything he could. I do not know what medicine he gave; nothing more than injection of quinine, I think, into his arm. I saw him do it several

times. He did not give him any other medicine that I saw; nothing more than a foot-bath and a mustard-bath. The doctor wanted to give him medicine, but he would not take it. I don't know what he wanted to give. The captain appeared to be suspicious, and absolutely refused to take it. Then all the doctor could do was to inject quinine in the skin of his arm. Before he was taken sick this night I speak of he had not taken medicine internally for some days. There was one day he ate a great deal, contrary to the doctor's wishes. He ate sardines and other canned food. That was, I think, the fourth day of his sickness. He seemed to have a hearty appetite. The doctor did not want him to eat the food he was eating. It was the night of the 6th that he woke up worse, and he died the morning of the 8th. He seemed to be unconscious after that. He lay in his berth with his face down all the time. His face was flushed, and I noticed a good many sores around his mouth and at the side of his nose. He breathed heavily; not stertorous breathing, but it appeared as though it were hard for him to draw his breath. He never was conscious after that, that I saw; they said he was the next day, I believe. He was talking with Captain Buddington and Dr. Bessels the next day, but I did not see that. I could not tell you what was the matter with him. The doctor called it apoplexy, and I take it for granted that that was it.

Question. Have you any reason, in any way, to believe that Captain Hall died anything but a natural death?

Answer. No, sir.

Question. Do you believe anything else?

Answer. No, sir.

Question. Did you believe anything else at the time?

Answer. No.

Question. Did anybody else express to you any other opinion?

Answer. No, sir; I did not even talk with anybody about it. All this suspicion of his, and all this talk about his being afraid of being poisoned, were matters of delirium, when he was out of his head; and that was so understood at the time. He was buried on the 10th day of November, two days after he died. His grave was dug on the shore, and service was read. I was present at his burial. It was day-time, but it was all darkness there at that season. Everybody was kind to him while he was sick, and paid every attention to him they could. Nobody neglected or ill-treated him in any way.

Question. Was the doctor kind to him?

Answer. Yes, sir, and attentive. When he had these outbursts of suspicion, they tried to pacify him and pass it off.

Captain Buddington took command of the Polaris after Captain Hall's death. There was no formal assumption of command, but he took command by common consent under instructions.

On the 21st November the ice broke up in the harbor, the ship driving against an iceberg. The third day after that, the ice having got sufficiently thick over the harbor again, we sawed the vessel out clear of the iceberg. On the 27th of November a heavy gale from the southwest drove an iceberg in upon the vessel. The tongue of the iceberg coming under the vessel is all that saved her at that time—keeling her over so that it broke the ice down on the port side instead of going through her. It lifted her up. She remained on that berg during the winter. That is where the vessel received the most damage—from the rise and fall of the tide. She was over so much that it was uncomfortable living on her. It was almost impossible to get around on deck, the ship was over so much. We lived along in winter-quarters there all

winter, and everything went well. Every assistance was rendered, I believe, in the scientific operations that could have been by the captain and officers at that time.

I do not know what was done with Captain Hall's papers after his death. I saw some of them once or twice within a short time after his death, but I could not tell whether Captain Buddington put them away or not. His writing was peculiar. There was something about it that I could distinguish. I do not know anything about his journal. Do not know who kept his journal for him. I think that Mr. Myer kept the journal from Disco Bay up to the time we went into winter-quarters; and, I think, after that Captain Hall kept it himself. It was kept in one large book similar to the one in which Captain Buddington's journal was kept. I do not know anything about a tin box in which his papers were put.

Question. Was anything done with his effects after his death; were they examined, sealed up, or anything of that kind?

Answer. Not that I know of. At one time I spoke to Captain Buddington, a day or two after his death, and suggested that Captain Hall's papers, &c., should be kept under lock and key. He said he would do it. I never saw any of his things or papers after that time. I never heard anything about any part of his journal being burned or destroyed in any way.

Question. Did you see, after his death, his journal read about the ship?

Answer. I think I saw it in Captain Buddington's room once or twice.

Question. Did year hear anybody after his death say that he felt relieved, or anything of that kind?

Answer. No, sir; I never heard anybody say that there was a load off of his heart, nor anything of that kind. It would have been something that I should have recollected pretty well if I had heard it; but I know that I did not hear anything of the kind. During the latter part of the winter Dr. Bessels and Captain Buddington were not on very good terms, but what the difficulty was between them I do not exactly know. I never heard any words pass between them that winter at all, I never heard either of them say what the difficulty was. I went into the observatory one day, I think in the latter part of February, and spoke to Dr. Bessels, which fact he will likely remember. I told him I did not hardly think they were doing right; that they were the two men that would be looked to to carry on the expedition, that they should consult together and make preparation for spring work. He concluded at that time, I think, that he would write a letter to Captain Buddington, but I cannot say whether he did so or not. I think I said the same to Captain Buddington. I told him that they were not doing right, that I thought they should consult together and make preparation for spring work. What answer he made me I do not now recollect. After that Dr. Bessels made a sledge journey to the south. Robeson Channel being open the most of the winter, we thought if we got north we should have to do it by boat. The 1st of April the boats were taken alongside, and built up on; we could not go north in the ship, because we were frozen in solid; but there was open water in the straits, and moving pack-ice up and down. Along the middle of March I think it was frozen over entirely, and remained so for a month. The ice was moving up and down, would go north and then south again; I cannot tell you what made it go north. We made a number of sledge expeditions to the outer cape, during the winter, to the north of Polaris Bay, and open water

was seen near the east shore of the channel. Sometimes the ice would be moving north and sometimes south. The channel seemed to be about fifteen miles wide at the narrowest place. It was darkness at that time, and we could not distinguish water from ice at a certain distance. I do not recollect the date when Dr. Bessels started on this journey south. The date is in the log-book. I think it was somewhere in the latter part of April. I kept the log-book. That was saved all the while. That shows a general statement of all that was done. Several parties were sent out hunting while we were getting the boat ready and waiting for open water in the channel. Dr. Bessels went once; Bryan and the two natives, Joe and Hans, went with him. They were gone, I think fourteen days. I do not know where they went except from what they say themselves. He claimed to have gone about sixty miles, I think, south of our winter harbor. After he came back we were waiting for the opening, and while waiting the scientific operations were carried on all the time; but nothing else was done until we started on that boat journey, except having the provisions got from the shore to the vessel that had been landed the fall before. The ship was leaking; we were pumping with steam all the time trying to keep her clear. We had fire under the small boiler, just enough to work the donkey-pump.

We started on that boat expedition on the 3d day of June. The 5th I left Cape Lupton. On the 6th near the outer cape, I lost my boat and nearly everything I had in her. I was then obliged to go back to the ship over the land and ice. I fitted up the Hagleman canvas boat and left again on the 12th of June. That boat was, I think, 24 feet in length and 4½ feet in breadth, made with canvas stretched over a frame; I think the frame was made of oak. There was nothing put on the canvas at all; it was just ordinary canvas. This boat leaked badly. The first day after I left Cape Lupton I went up twenty-three miles before I landed; she then leaked so that we had to keep one man constantly bailing to keep the water out of the boat; there I found Tyson and his boat's crew. They started from Cape Lupton the third day after I left with the first boat that I lost; Here we lay at that place on the edge of the floe a week. The pack-ice opening a little, we started north again, and reached about two miles and a half from where our first camp was on the ice. That is the farthest point we got with the boat above the outer cape—about twenty-six or twenty-seven miles above Cape Lupton. We returned by the mouth of Newman's Bay, the pack moving down and south all the time. When there were one or two severe gales of wind from the southwest the ice started north a little, and when it was not blowing strong from the southwest the ice was moving south all the time. If I had had my first boat I thought I could have got across the channel, and I should have tried it. The ice opened once or twice. The wind was blowing fresh. The canvas-boat we could not pull; the boat's crew got a little frightened at the condition of the boat. If I had had my first boat I started in, I should have tried to get across, and I think I should have fetched the west shore. The other boat lay there on the ice, a little to the south of where I was, about a mile. We were not able to get any farther north than we did with the boats. I staid over until the 20th of July, I think; then I had to abandon my boats. I received two notes from Captain Buddington to return to the ship. We had to stay there so long that I thought we might get short of provisions. Two of my crew volunteered to go to the ship and bring back some bread. If the ice did open we would not have to return before the latter part of August. When the men returned to the ship the

captain kept them there, and sent back a native with a note to me, which I have in my pocket.

The two letters marked respectively "No. 1, C," and "No. 2, C." "No. 1 C" are as follows:

Mr. H. C. CHESTER:

"SIR: Received your letter yesterday, and started north under steam. Have been moving along the pack edge and firing off guns to attract your attention. The present condition of the vessel requires your immediate return. We are going back to the old harbor, where you will follow us with both boats immediately. We have attempted a landing on the cape south of Newman's Bay, but in vain, and have followed along the pack edge to discover a lead without success.

"Yours, respectfully,

"S. O. BUDDINGTON.

"Hans will come back with you."

Captain Buddington sent the boat's crew back afterward, and they brought the second note.

The second note, "No. 2, C," is as follows:

"ON BOARD UNITED STATES STEAMER POLARIS,
"*Thank God Harbor, July* 1, 1872.

"H. C. CHESTER:

"SIR: Your presence and that of both boats' crews are required on board, because I intend to get the vessel as far north as possible, and at as early a time as possible. We are burning now from one to one and a half tons of coal daily to keep the vessel free, all the bulk-heads and other spare wood being used up.

With the crew which has remained on board I cannot proceed with sails, and if open water makes north, we can penetrate our way through the ice far better, provided you are aboard, and do not run any risk of getting separated from any one of the party. The ship has been full of water once, and most of the perishable provisions in the hold have been spoiled. It occasioned [happened?] that the limbers had been choked, and the water could not pass the bulk-heads, which was not discovered until fore-peak and main hold were nearly full of water.

"Yours, respectfully,

"S. O. BUDDINGTON.

"N. B.—If, however, you think it advisable, after consulting with Captain Tyson, to proceed farther north with the boats, after having carefully read the above information, I am not the person that will attempt to stop you from doing so.

"S. O. B."

After receiving the first letter, I sent Captain Buddington a note requesting one of my boat's crew to return. The prospects were that we should have to lay there some time to get the boat down by water, and if we had to take it by land I wanted more crew than we had there. Another idea I had was that if there was an opening while I was there, I should have proceeded north, because I was under the impression that when I started overland to go to the ship I had gone as far north as I should go on that expedition, for I knew when we could not work up Robeson Channel with a boat, they could not do it with a ship, especially a leaky one. The next day, I think it was, Tyson wanted to get his boat into the land, and I sent my boat's crew to assist him. They worked two

days and one night to get the boat in to land. One of my boat's crew returned, and it was there four or five days on the edge of the ice. There was no opening either way, north or south, and I took my boat in to near Cape Sumner or Sumner Headland. The boats were both left there; one of them secured by canvas being taken from off the frame and the frame folded up and laid on the sled. The instruments and everything we were obliged to leave were put under the canvas and then stones piled on them. The other boat was left right side up, with a boat-cover over her. That boat was stove before we left there, but I secured her with ropes and stones before I left. As quick as I got my boat secured, I sent all my party overland to the ship except Herman Siemans. I kept him there till we got all the clothing dry and packed up snugly to leave, in case we should want to come back and get our boats to go north. We then walked back overland. Mr. Meyer had been with me on this journey, and Dr. Bessels was with Tyson in his boat. Seimans and I were about twelve hours, I think, in walking back overland to the ship. We found the ship at anchor, at the same place, at Thank God Harbor. She was grounded at low tide at the stern. She was leaking, and we were then pumping by steam. Several days after I got back we commenced pumping by hand, and we found that we could keep her free by pumping from five to eight minutes in an hour with a large hand-pump. The pumping by hand was continued up to the time we got up steam to leave Thank God Harbor to go south, which was the 12th of August. On the night of the 11th of August the wife of the Esquimaux Hans had a son born at Thank God Harbor, in latitude 81° 38′. He was named Charles Polaris, after Captain Hall and the ship.

In starting on the 12th of August we steamed down through the ice until we got to the south cape of Polaris Bay; then we came into open water. We steamed down Kennedy Channel that night; we had very little ice. In the morning we had some fog. We were steaming along with full head of steam through the clear water, when, about eight o'clock, the fog lifted and we found we were near a small island, which, from its peculiar shape, we recognized to be the same island we had passed through the fog in coming through Kennedy Channel. We were about five miles from that, and on the other side. We were between this small island and a large one that lies near the middle of Kennedy Channel. That is not marked on the chart. There we were beset thirty-six hours. While there, I think Bryan got some observations on the ice. We again got clear and steamed down farther south until we got beset in the ice in Smith's Sound. I think we never moved from there until we broke adrift, which was on the 16th day of August. We could get no farther; we were blocked up with heavy floes of ice, and were obliged to tie up. We had followed the heavy ice; we tried to keep the west shore, but it was all solid ice, so we moved where the water would lead away from the west shore until we got nearly to the middle of the sound. We were tied up to that floe and floated down with it, until the 15th of October, two months. We made several attempts to stop the leak by drawing a sail under the bow. We also tried to get out some of her ceiling forward and build up a bulk-head to keep the water from flowing aft. The greatest leak appeared to be in the forward end of the vessel. We knew that we had not sufficient coal to pump the vessel to keep her afloat during the winter. We knew we had got to let her sink some time during the winter, even if we had laid to the floe. We were pumping all the time we lay at the floe, the most of the time by steam, not with the small boiler, but with a still smaller boiler, that I suppose we had

had to burn blubber. I believe that is what they call a donkey-engine. That was rigged so as to work the donkey-pump. It did not consume much coal. We then drifted through Smith's Straits. We drifted past Cairn Point two days. There was not much ice to the south, and we were going with the current pretty fast. On the 14th a heavy gale came on from the south. It was about 6 o'clock in the evening of the 15th when the ice first broke around the vessel, setting her off on the starboard side, leaving open water on one side. We still were fast to the floe and driving with it. We kept on driving with the floe until we met the ice that first nipped the vessel; she was driven out on the ice, and there was so much snapping and cracking at first that I guess there was no one aboard but what thought the bottom was out of the vessel entirely. Those who were on the ice were very glad to get there. They considered themselves in the safest place there; everybody thought that the safest place. I know at that time it was very difficult to keep men enough on the main-deck to get the provisions and stores off the ship. We worked until we got the provisions off the main-deck. Then I told the four men, who are here now, to get out on the ice and begin to drag the stores and provisions back from the edge of the floe. I then turned to go into the house to get the ship's log and a clothes-bag of my own to jump out with, and one man, G. W. Lindquist, started down the ladder, but the ship started so that he could not get down the ladder. He then went on the ice on one of the hawsers. He was the only man that went away from the ship after I told them to get off. There was no other way for them to get out except on the hawsers. In a moment the ship broke adrift on the floe. There was a heavy gale at that time; it was dark and there was a snow-drift. There was a moon, but it did not give much light. We could not see much in the snow-drift. The ship broke loose, and I saw the piece of the ice upon which part of the provisions were, brake adrift at the same time the vessel did, and I saw one or two men on that piece of ice, but we could not render them any assistance. The first thing I did as soon as the vessel broke adrift—as I found she was taking water fast—I got the men out to clear away the snow and get at the deck-pumps; and all but the firemen and engineer worked at the deck-pumps until we got the fire going under the small boiler to pump the vessel with. She drifted to the north and east in clear water. I think it might have been three-quarters of an hour that we kept her afloat with the deck-pump before they got sufficient steam to pump with. We were obliged to do that to keep the water from getting up to the fire; we were just able to do that. When they got the fire under the smaller boiler, they were able to keep her clear with the donkey-pump. We found ourselves at daylight about six or seven miles to the north of Littleton Island. We were about three miles from the mainland. I do not know how far we were from where we got adrift. We could see no land. I think that I saw land once, when the ship was driving away, but could not say positively. When it came daylight, and it got light enough for me to go to the mast-head with glasses, I did so; and I saw a piece of ice with provisions on, that we had landed—or a part of the provisions. It was about four miles from us, in a heavy stream of ice that was south of us—between us and Littleton Island. It extended off to the north and west, across the strait. South of that was an open sea of water about ten miles in extent; and then I could see the edge of the main pack of ice south of that. Where I saw this piece of ice with provisions on was in a narrow stream of heavy ice. I did not see anything of the floe that we had been tied to. I do not know of any one

else being at the mast-head on this occasion. I believe there was one seaman who went up to the mainmast-head at one time when I was not there. I was up an hour, I think, the first time. It was about 6 o'clock in the morning when I was there. Between us and the piece of ice that I saw with provisions on there was nothing but small ice—newly formed ice seven or eight inches in thickness. This piece was not over fifteen yards across. At that time we were pumping with steam on the vessel. I came down from the mast-head and began to clear the lockers that we put up in the fore passage, to make us a boat. We had no boats on the vessel, and I conceived that it would be necessary that we should have some kind of a boat in case any accident should happen to the vessel. We had to get out some way. All hands were set to work making provision for getting out the coal and making the boats, and so on. We at that time had an idea that we would have to get on the ice right where we were. We were bound in the ice. I saw that all around us it was newly formed ice, about eight inches in thickness. While we were at work getting ready, the ice opened in between us and the land, and a light breeze sprung up from the north. We made sail, and with the aid of steam in the smaller boiler, after cutting the ice out of the propeller well, and away from the rudder, so as to move it—and which, of course, took some time—we got started in toward the land. I think it was 4 o'clock in the afternoon when we grounded the vessel as near as we could to the shore, or shore-ice. I think it is the only place within three hundred or four hundred miles either way where the vessel could have been grounded. It was the main point where the ice was clear very late in the fall, and where it was clear early in the spring. There was a strong current setting down between Littleton Island and the mainland that kept this more or less open. It was near what was called, I think, by Dr. Kane, Life-Boat Cove. I was up and down the mast-head all day every ten or fifteen minutes until we got near the land. I went up there to look for our lost parties, but I could not see them at all; they were nowhere to be seen. They were nowhere within twelve or fourteen miles of us, unless they were behind Littleton Island behind a large iceberg that lay outside of it, and close to it; because if they had been I could have seen them from where I was with the glasses I had, from the mast-head. I could have seen them if they had been anywhere within ten miles of the vessel. I did not see the house which we built. I saw nothing but the small piece of ice broken off with the provisions on it. It drifted down not quite so fast as the vessel. I do not know what became of that. We did not make any attempt to follow it, because we could not. There was not any more coal than enough to have got up steam in the large boiler. We had to follow the lead of the ice toward the shore. We could not go any other way. We did not expect when we started to get ashore, but thought that we would get as near the land as we could. We kept on drifting to the south a little all the time with the current and the wind, and we reached the land before we got as far south as Littleton Island. I think if we had seen our comrades on the ice we could have got to them. With the wind the way it was that day we would have tried to have got to them with sails.

I can only account for our not seeing them while they could see us in one way. When we steamed in and got near the land then I was on deck, and no one was at the mast-head. We supposed then there was no possibility of seeing our party anywhere, and the only hope we had was that they were near the land. We knew that they must be near the land on the east shore, and indulged the hope that Hans, who was

with the party and was acquainted with the country, and had lived there so many years, would, as quick as daylight came, have them take their boats and try to reach the land with the party. If they saw the vessel at all it was just before she struck the shore after she got inside of the range of Littleton's Island from them. The time that they saw us must have been about the time that we were just reaching land, and at that time there was nobody at the mast-head. We had been looking for them all day, but had given up all hopes of seeing them. I was at the mast-head of our ship all through the day until just before the vessel was grounded. We had good glasses, and I could raise nothing that looked like boats, men, or anything of the kind on the ice. All I saw was this piece of ice with provisions on. Where we grounded was about two miles or two miles and a half northeast of Littleton's Island. If they saw the smoke-stack they must have been north of Littleton's Island; because I have been to Littleton's Island since, and I could not see the smoke-stack from the ice at Littleton's Island, and that was only two and a half miles from where the vessel was run ashore. There were hummocks and small icebergs that lay to the south of us, between us and along on the shore, the point that made out toward Littleton's Island. The only way we can account for not seeing them is that they must have been behind Littleton's Island, from us, or behind the berg that was there, because from the south part of Littleton's Island was all open water, which extended across the straits. It was several miles south of Littleton's Island, to the edge of the main pack that extended the whole width of Smith's Straits. They might have been behind some of the hummocks, but I think I could have seen seals six or seven miles distant on the ice that morning, for it was clear, fine weather. They must have been behind some obstacle, because there were nineteen people, including the children, two boats, India-rubber blankets, colors, the house, and all the provisions, and that would make a pretty extensive object. It is possible there might have been refraction in the atmosphere, such as frequently occurs at sea, which would have lifted the vessel up by a mirage, which brought the vessel in sight above, while we could not see them, but I did not know that there was any such thing, and did not notice anything of that kind in looking toward them. Northumberland Island is distant from Littleton's Island about eighty miles. I will state that Captain Buddington was on the house all the time, and nearly all the hands were on deck. If we had rescued the party on the ice, we would have been able to have recovered our ground better. They would have brought the boats which we needed, but we should have had to build other boats, because those they had would not carry the whole party.

I will state that, as regards personal safety, I think I should have preferred being on the floe to being on the ship, because we did not know the condition the ship was in at the time of the separation. The snap and crack of the timbers of the vessel when she was nipped and thrown on to the ice of course led every one to feel uneasy. There was no one on board but who thought that she was more or less injured, and when she settled back into the water, that she would likely fall to pieces and sink. That was the general impression of all hands at the time, I guess. The other party had the boats and the kyaks, the natives, and the scow; and most of the provisions on the vessel were landed there. All the skins of the musk-ox and the largest part of the clothing of all descriptions were hove out on the ice. I do not think Captain Buddington ordered any men to go on to the ice. The only order I heard given was to "overboard provisions." About the first thing we

did was to lower the boats. The most of the men had to get out to take these boats clear of the side of the ship. But before doing that most of them threw their clothes-bags out and got them on to the ice. After they got out there they didn't care about coming back on board the ship again, and remained on the ice. Of course it was necessary to have some men there to take back the provisions. I think Captain Buddington ordered the boats to be lowered. When the ship grounded at Life-boat Cove we got out lines and made fast to the hummocks of ice there. The next morning at daylight we got up what coal there was in the bunkers on deck. The next day we sent down all the topmasts, booms, and gaffs, and dragged them on shore and built the house, and then we next commenced landing the provisions and taking off the coal that was on the vessel. The stock of coal that was left on the steamer was about five and a half tons. We built up a house and were there some three days, I think, before we got the house finished and got moved in. The fires were let go out, I think, at 6 o'clock in the evening. The next morning at 8 o'clock the water was within two feet of the main-deck of the Polaris. I did not examine her condition, any more than I could see that her stem was stove in about three feet, and the stem itself gone, and the wood ends and some of the planks four or five feet in length broken off and turned right around, and some of them were still hanging by the slivers. I do not know whether that was done on the iceberg or not. I do not think it was gone at Polaris Bay, because I should have seen then. It was not gone until we went adrift that night, I think.

I did not know how the vessel could float when I looked at her stem; she was in such a condition that she could not possibly have been repaired and brought out. The stem was entirely gone. Perhaps if we had been in open water, and had plenty of coal on the steamer, so that we could have pumped by steam and kept the vessel steaming, we might have got her into one of the ports of Greenland, but she would not have been safe to have left a Greenland port to have come here in. We could not have kept her up after we had got her in port without pumping all the time. When she had reached the land, she had done all that she could do, and that was an end of her usefulness.

After we grounded we were on the lookout for a number of days, thinking our lost party would land somewhere to the south, and work up to the north. We knew Hans was well acquainted with the country, and we thought it likely that under his guidance they might reach us. We made this place our winter-quarters, and remained until the 3rd day of the next June. We built boats from the linings of the cabins of the Polaris. I superintended the operations of the building of the boats myself. We built two boats for ourselves. We built a small one for the natives there. The ship afterward sunk. As the ice broke up, she worked off shore a little all the time. She was full of water and working off all the time. Her rail was just out of water at high-water mark when we left. But there were lines fast to the shore. One line was let go when we left with the boats. We had to let that go, in order to get by with our boats. I believe we told the natives to make that line fast again.

During the winter nothing of special consequence happened. The scientific observations were kept up. We did not keep up the observations of the tides, because we could not. Dr. Bessels tried to make some arrangement for taking the tide observations there, but he could not do it. He had to go off shore too far, and could rig no apparatus.

I kept a journal until I lost it in my boats in the spring of 1872, when we were up in Newman's Bay. I have kept none since then. I kept

the regular log of the ship. That was kept in two of those large books—printed Navy log-books—which had been supplied to the ship. They are at present up at Lifeboat Cove. I made a fair copy from those two books into a smaller book. This copy was word for word. This book is here. We found that these large books were rather too heavy to carry with us in our smaller boats. We found it better to copy them in something lighter, in order that we might save the contents if we could. I therefore copied the contents myself into this smaller book. This copy is all in my handwriting. The original log was all copied by me, and is in my handwriting, except when I was absent in the boat journey at Newman's Bay. This copy was made by myself. This book I have had in my custody all the time. We left with boats on the 3d June and boated down most of the way in open water, keeping the land-floe of ice until the 23d day of June, and about twenty-five miles south of Cape York—Cape York was plainly in sight—we were taken up by the Ravenscraig whaler of Dundee. We were on board of her altogether until the 6th day of July. Then seven of us were transferred to the Arctic. Afterwards, at what time I do not know, but some time afterward, three others were transferred from the Ravenscraig on board the Intrepid, and those are the three that have not arrived. They are Mr. Bryan, Joseph M. Mauch, and John W. Booth. This transfer was made in order that we might be divided up, as all being in one vessel was rather more than it was supposed the stores of one vessel could supply. When the Arctic was ready for home we saw the Ravenscraig and took off the men from her. The other ship, Intrepid, was in sight, steaming away. We had to come away and leave that party. The vessel with the other party is likely in Dundee now, or on her way there. We were treated very kindly indeed. We were taken to Dundee, and there we were cared for by the United States consul and supplied with clothing, and came home in the City of Antwerp. We were in Dundee about four days.

The discipline of the ship was first rate during Captain Hall's life-time. Afterward the discipline the first winter was very good. I do not know but what it was good enough all the time. I do not recollect of ever giving a man an order on the ship but what it was executed very promptly and quickly, without any hesitation, from the time we left Washington City. It was as good discipline as ever was observed on a whaling-vessel. We had a remarkably good crew, as good a crew, I think, as ever went into the arctic regions. They were just the men needed on an expedition of that kind. I do not know whether Captain Hall's papers were put out on the ice at the time of breaking loose. Captain Buddington was superintending all that, and worked himself there. I was at work on the main-deck. If they had been put out, they would have been put out at the stern. Nearly all the provisions were carried back and put into one pile. There were some men that were clearing away from the forward gangway, and some aft. As a whaling commander Captain Buddington, I think, does very well, but not so good for a north-pole expedition. He has not that enthusiasm for the north pole that Captain Hall had, or Kane had. He drank a little occasionally, and I have seen him once or twice in a condition that we would call "boozy." I do not know anything about his drinking alcohol on board the ship. I have seen him boozy when I thought there was nothing else on board; but I do not know anything about his drinking it. I think he had been drinking a little the night we got beset in the middle of the channel coming down. I never heard any words pass between him and Captain Hall at all. I heard there was a little trouble in getting

out of St. John's. Captain Hall appeared to have a kindly feeling for Captain Buddington—more than Captain Buddington seemed to have for Captain Hall. I got that impression from what I saw on the vessel of the actions of the two men. He at times rather depreciated Captain Hall, in using language around the main-deck that should not have been used by a man in his capacity. When I say "main-deck," I mean among the seamen. He did this when he was sober. He did not speak very respectfully of the commander, or of the expedition. I cannot, however, recollect any particular words or any particular expressions that he made use of at any time. His idea was, as it struck me, that the enterprise was all "d——n nonsense." He did not seem to have, either, any regard for the scientific work; he thought that was all nonsense too. He never appeared to have any trouble with it until after Captain Hall died, then there appeared to be some little trouble between him and Dr. Bessels. I never heard any words between them. I do not know whether they ever had any or not. They did not in my presence or hearing Captain Buddington expressed himself as being of no use in the expedition, and depreciated Captain Hall in the presence of the men. I do not know that I ever heard him say anything against Captain Hall's authority in the presence of the men. He did not seem to question that at all. I do not know that I ever heard him say that he was no seaman, or anything of that kind, but he regarded the whole thing as foolishness. I heard nobody else make such a remark. I never heard a man on the vessel say anything but what was encouraging of the expedition except Captain Buddington. What I did hear him say in the presence of the men I regarded as very improper, when said by a person acting in the capacity that he was. It was said so that all of us could hear it. It was not especially addressed to the men, but they all heard it. The Polaris began to leak in Thank God Harbor after we got into collision with the iceberg. The next spring, as soon as the water began to make around the vessel, we calked her from the outside. It was at the edge of the water. The ice was making between the sides of the vessel as it always does. Everything was done that a seaman could do with the means at our hand at that time to stop the leak. At subsequent times when leaks or other accident happened, everything was done that seamen could do, or ought or might do, with the means at our command, to remedy these things. Captain Buddington generally gave the orders, and I had the orders executed. I had nothing to do with the navigation of the ship. While I was away on boat journeys I made some observation of the latitude, and I made some observations on the ship. When we left the house, we left behind in it a few cans of dried potatoes and a very few cans of meat; I think there was a little meal in the barrel and a little flour in one barrel, and some bread; we gave them to the Esquimaux. We left no books or valuable papers, nothing but what were put into chests and boxes and stones piled up over them. These cairns were about one hundred yards up the hill, and about twenty feet, I guess, above the sea-level. We explained to the Esquimaux that these were books and papers, and nothing to eat, and told them not to disturb them. There was nothing of value of any description left there that we could take away. The pendulum, the transit, and other instruments, Captain Hall's arctic library and other books, were packed up and left in the same cairn. Dr. Bessels had a trunk with thermometers and some of his scientific instruments in it. They were all put in this cairn. The log-book of the ship was also placed in it. The canvas boat was not good for anything. It would ferry us across a river. It would stand quite a little sea, but then the canvas ought to be prepared so that the water will not go

through it. This canvas had been lying out all winter exposed to the weather and the driving snow. It had been on a pile of stones ashore all winter. It was taken right off and put on to a frame, and it leaked pretty badly. When we left the Polaris she was still aground and full of water, and tied up to the shore. I have heard it said that Captain Buddington gave her to the Esquimaux, but whether he did or not I do not know. I do not know whether I heard him say so or some one else. The ice drifted north and south in Robeson Channel both ways. It drifted northward when there was not a south wind or southwest wind blowing. In the winter the farthest we could get out was about this outer cape. Here (indicating on the chart) the ice sets up and down with the current and sweeps up this way, (indicating.) The ice ran down along the harbor. The ice was coming down southward continually right through while we lay at Newman's Bay on the land-ice. The pack was moving south most all the time. At Thank God Harbor there was plenty of open water, still these straits at Newman's Bay were full of pack-ice moving down. The vessel started out from Thank God Harbor two or three times. She came up around the cape part of the way to Newman's Bay from her anchorage here, (indicating on the chart.) She struck this moving ice, and followed the edge of it nearly two-thirds of the way across Robeson Channel—a solid pack edge. The pack-ice went into Lady Franklin Bay. Here by these islands, (indicating,) when we came down, we found a great deal of open water. There was no difficulty in steaming down at all, notwithstanding all the ice that moved through Robeson's Channel while we lay there, which was about forty days. I could not tell which direction the tide came from, whether from the south or north, on the flood-tide; it just rose and fell. I could not tell anything about the drift; I only know this ice was going south all the time unless there was a south wind, and then it would move slowly to the north in Robeson's Channel. I noticed, some days when it was calm, that the ice was moving south over one tide, whether it was flood-tide or ebb; did not see ice disappearing down this southern fiord; it was frozen; at least it was full of ice here when we came out. We found wood on the south side of Newman's Bay, but on the north shore of Polaris Bay we found no wood, nor on the north side of Newman's Bay. It was the same kind of timber I have seen in Behring's Straits. It looked similar to it.

Without concluding the examination of witness, the commission adjourned until to-morrow morning at 11 o'clock.

The chart made by Mr. Meyer is generally correct. There are some small inaccuracies. Cape Constitution is in latitude about 80° 20′, I should think. I think it is about right on this chart. I think there are some inaccuracies in the outline of the coast at Newman's Bay and above. The track of the first journey by Captain Hall and myself is not accurately laid down, but generally the chart is pretty correct in regard to our new discoveries and the coast-line below.

Examination of William Morton.

I was born in Ireland. I have lived in this country thirty-one years. I reside in Jersey City, N. J. I am a seaman—follow the sea for my living. This is my third trip to the arctic regions. I went first with Captain De Haven, in 1850, in search of Sir John Franklin. The second time I went with Dr. Kane in 1853, in search of Franklin, taking

another route. This is my third expedition. I have spent most of my time since I came to this country in the regular naval service of the United States, generally as a petty officer—principally yeoman. I sailed from Washington on board the Polaris, as second mate, on the 10th of June, 1871, to New York, with Captain Hall; thence to New London; thence to Saint John's, and from there to Fiscanaes.

Nothing of interest happened up to that time. We went from Fiscanaes to Holsteinberg. Captain Hall thought the Congress might call in there. After a few days we went from there to Lievely, on the island of Disco. There we remained a few days, when the Congress arrived. At Disco there were a few words of misunderstanding between Captain Hall and, I understood, the scientific officers—Mr. Meyer and Dr. Besels. It was, however, all arranged amicably before the Congress left. Captain Davenport came on board and gave advice to the officers and ship's company. From Disco we sailed to Upernavik. I do not know the date of sailing, as I did not keep any journal. From Upernavik we sailed to Tessuisak, which is the northernmost Danish settlement of any account. We went there to get the rest of our dogs and furs which we could not procure in the southern settlements. From there we went through Melville Bay, and made our way north. We left Tessuisak on or about the 24th of August. We went through Melville Bay without any obstruction, except merely taking an irregular route, but we did not meet any ice to hinder us—none, at least, that we could not easily get around. We were at Cape Alexander the third day, almost to the hour, from leaving Tessnisak. We found the entrance into Smith's Strait free from ice, and passed Littleton Island, and there saw a good number of walruses playing. We fired a few shots at them, but without effect. We went up considerably farther, but not so high as Kane's winter-quarters, when we struck off to the west shore, not following the east shore as he did. During that night, about 12 o'clock, we fell in with a barrier of ice that gave us the thought that the passage of our vessel was obstructed in Smith's Sound. We discovered, however, a lead inshore between this heavy floe and the west shore, and by going back on our route several miles we headed a tongue of ice and got into an open lead, and went on without obstruction to Cape Frazer. We passed several known places, but I think it was there that Captain Hall stopped and went ashore in order to leave a depot of provisions, where we could seek a harbor in case of necessity. He found the place too shoal for the ship to rest in to make winter-quarters of, and so we went from there to Kennedy Channel, still unobstructed by ice. We went through Kennedy Channel, meeting occasionally a patch of ice, but not enough to obstruct the vessel from proceeding. We passed Cape Constitution, and recognized it by the two islands, but were not as near to it as I should like to be to make an accurate survey of it with the eye.

Another island that Kane's party did not discover before is on the opposite shore and a little higher north. From the position of Kane's party at Cape Constitution it was land-locked or lapped in with the opposite shore, and was taken for a head land of themain-land. That is about the narrowest place, in my opinion, between the islands. It does not look so wide as it actually is. For instance, Franklin Island from the pitch of Cape Constitution is six or eight miles, but you think, by being in the middle of the channel, that it is leaning right up against the land; and then the other island, over on the west side, is twelve or fourteen miles at least from the shore, though it seems much nearer, and that leaves the channel there, in my opinion, between twenty-six and

thirty miles wide, that is, from main-land to main-land. Above that there is an open area of water. Hans and I, when with Kane's party, saw that. We could not see the land to the eastward of Cape Constitution, but, looking westward, we saw land until it dwindled into space some forty or fifty miles off, I suppose. I could not say whether we went between the islands or not, because it may have been my watch below. We went right ahead, and with very little obstruction. In fact, when we got into this open area, the water which we supposed to be a sea we found to be a large bay, perfectly free from ice. This, which had formerly been called Kane's Open Polar Sea, we found to be a large bay, at that time clear of ice. We could see the land on either shore as we passed through, but could not see the land ahead until we got clear up and the fog then existing had cleared away. Then we found an entrance to the eastward. We passed that and a large entrance to the westward, and that is called Lady Franklin's Bay. The entrance to the eastward was afterward called the Southern Fjiord. That is the name given by our party. The entrance to the westward was Lady Franklin's Bay. Steaming across the head of this bay we discovered another channel leading to the north-northeastward, or thereabouts. I should judge it from twenty six to thirty miles wide and narrower than parts of Kennedy Channel. That was named, by Captain Hall, Robeson Channel, after the present Secretary of the Navy. We went up that channel considerably, I disremember exactly how many miles, and the first real obstruction we met up there was the heavy pack-ice that extended from shore to shore of this channel, with a small lead on either shore. At a place on the east shore Captain Hall went ashore in a boat, on two occasions, to look for a harbor, but found none to suit. He called it Repulse Harbor. The second time he came back and called a consultation of his officers, on top of the house, comprising Captain Buddington, Chester, Tyson, Dr. Bessels, and myself.

If there was any other consultation among the officers I was not present, and am not aware of it. Some of these officers were for going north if possible, and others were for looking for a harbor immediately; and I think Captain Buddington preferred going back, at least, to what was afterward known as Newman's Bay, for a harbor. Captain Buddington was in favor of falling back to that place. We tied to the ice at the time, and after a little while we proceeded toward the west shore, where there appeared to be some open water, and possibly a lead along it into an open space of water that we could see in fact; we saw the clouds over it, and it widened where the land fell off on both sides. While going over we got beset, and the ship got nipped, but not to injure her; that is, the ice closed on to her, and she was in danger of being injured. Captain Hall ordered provisions out on the ice, so that in case of accident we might have something with which to support ourselves. Afterward the ice eased off, and the next day we took the provisions on board again. We were then drifting rapidly with the ice down Robeson Channel to the southward again. We reached our highest point August 30, 1871, when this consultation was held above Newman's Bay. Our latitude at that time, by dead reckoning, was 82° 26′, but it was afterwards found by observation to be 82° 16′. I think that was the highest point we reached, and that was the same day that we had the consultation. The next day we were south of that latitude; we never got any higher than that in the ship, nor did anybody get any higher on land. Repulse Harbor, the place Captain Hall went ashore, was the next highest point we reached; that is but a very short distance below the highest point. After we got beset, we floated down to the southward to

where Robeson Channel widens into the bay. In the bay now called Polaris Bay we got a lead to the southeast, and went into that and got under the lee of the shore in Polaris Bay, some four miles from Cape Lupton, at the mouth of Robeson Channel, and came to anchor there in a kind of cove; it could not be called a bay; it was a sort of indentation in the shore. We came to anchor there inside of a grounded iceberg; we left there the day following. While Captain Hall was on shore he thought he saw a place deeper in the bay, and we got under way and tried to get to it, and after steaming around a few hours we did not find any better place, and returned and came to anchor in the same place inside of this grounded iceberg, which was named by Captain Hall Providence Iceberg. It was grounded in about thirteen fathoms of water. Here we intended to remain, so far as I know, and in a few days commenced landing our provisions on shore.

No attempt was made to go farther north; it was late in the season. It was dangerous, in fact, and I did not know that Captain Hall contemplated leaving there to go north; I never heard any suggestion of that kind; it was beyond the time for navigation. Hard frosts had set in, and we could not have got the boats through the ice, and it was not strong enough to walk on, so we were detained a few days until we were finally able to walk on the ice, and after that we took the rest of our provisions on shore and built a house for observatory purposes. The ship was a full quarter of a mile from the shore, and the house was about a hundred yards up the side of a hill, where our provisions were put. We landed all our provisions there and made preparations to winter, by clearing the ship of almost everything in her; we cleaned her right out, with the exception of a few trifles, such as whaling-gear and marlin-spikes, which were kept in a store-room on board. We then covered our vessel with canvas made in Washington for the purpose before we left, and made everything comfortable for winter-quarters. We cleared out the after lower cabin for sleeping-apartments. The rooms on deck had to be forsaken, as they could not be kept warm. We housed our vessel, and continued there during the winter.

Captain Hall went off on asledge-journey about the 10th of October; he was absent some fourteen days. He was accompanied by Chester, the first mate, and the two Esquimaux dog drivers or hunters. He returned in fourteen days exactly.

Question. How long was he gone?

Answer. Fourteen days. He came back on the 24th in good spirits.

Question. What time in the day did he get back?

Answer. It was before our dinner-hour in the afternoon; I think it was about 2 o'clock, though I will not say as to the hour. I was ashore when he came. I met him on the ice between the ship and the shore. I shook hands with him; asked him how he was; he said he was right well, and glad to find everything so well and pleasant on board; very much pleased with the proceedings since his departure. I went on board with him to the upper cabin, and I staid with him at that time, except when he ordered the steward to get him a cup of coffee. While the steward was gone for the coffee I went to get him a shift of fresh clothing. He ordered the steward to bring him a cup of coffee, as I have said, and he went to the galley and got it.

Question. Did the steward bring it back while you were there?

Answer. I don't recollect. I went to Captain Hall's private store-room to get him some clothing, and when I came back he was vomiting. I was alarmed and asked him what was the matter. He said, "Nothing at all—a foul stomach." I was not gone more than twenty

minutes; it could not be much more. I sought some clothing that he wished to put on.

Question. Who was with him when you went after the clothing?

Answer. Hannah was there, and I don't know whether Captain Buddington was there or not. He came on board also with Captain Hall. There was also Joe, the Esquimaux, and the steward. I don't know of anybody else, except, perhaps, Dr. Bessels.

Question. Was anybody with him when you came back with the clothing?

Answer. Not that I recollect. Other people may have been with him previous to that, but they had gone out; for instance, Chester and Tyson had gone out and shaken hands with him.

Question. Then nobody was in the cabin with him when you came back?

Answer. Not that I recollect now. When I came back I asked him what was the matter; he said there was nothing the matter except a foul stomach. I proposed getting some hot water to bathe his feet, which was done, and his clothing shifted. After we got a clean shift of clothing on him he went to bed. He was then proposing to start the next day on a journey south, and intended to take Captain Tyson with him, but his sickness got worse. The next morning he was so bad that Mr. Chester and myself proposed not to leave him alone during the night. He was alone without any watcher the first night, but he got so bad the next day that after that Chester and myself kept watch with him during the night, watch and watch. Captain Hall spoke against it, and said he did not wish to put us to so much trouble. We insisted on it, and continued it till he died. I heard him asking for an emetic; he said it would do him good. The doctor was there also, at the time he was vomiting and sick, and I believe while he was taking the coffee. He asked the doctor for an emetic, and, as far as I could understand, the doctor said "No," he was not strong enough, or it would weaken him too much, or something to that effect. He got delirious very soon after the second day. He got suspicious of some people, and said they wished to harm him, and he said to me, "They are poisoning me." I thought he was out of his head; indeed, I knew he was. He said to me, "Whatever I want you will get for me, and see that it is all right—see that there is nothing in it. You were a friend of Kane's, and I want you to be a friend of mine." He got me to make tamarind water and arrowroot for him. Other things the cook cooked and Hannah administered. But during my attendance upon him he would take hold of my hand when we were alone, and would say, "They are poisoning me, and you won't leave me." On these occasions I considered him out of his head. He was out of his head the most of the time. He continued this way six or seven days, and he then got right smart, and got up. He sat up, in fact, a great deal, on a lounge or bed. He used to rest himself on the lounge, and turn in occasionally. He got up and spoke about his journey, and went about his ordinary business for a day or so, and then relapsed. He then went to bed again, and got worse and worse until he died. The doctor told me, I think the second day, that Captain Hall's illness was very serious, and that he would not recover. That was the day after he was taken, or the third day at the furthest. I cannot rightly recollect what the doctor said was the matter with him; apoplexy, I think. He was not smart in his movements like, but I did not know particularly that one side was affected more than the other. He was feeble like—prostrated. He showed that feebleness very soon; not immediately after

his vomiting, but I noticed it the next day, when I put on his clothing. I had to help him, he was so sick and enfeebled at the time from vomiting. He had been vomiting and retching violently for probably ten minutes. He was vomiting while I was absent, and I cannot say how long. I assisted in putting on the clothes. He had my assistance, but he might possibly have been able to put them on himself. I was of great assistance to him, facilitating his movements. While he was sick I was with him a great deal during the day, and generally half the night. Either Chester or I kept watch all the time. Hannah was there during the day-time nearly all the time administering to his wants. After he grew delirious he got suspicious. I never heard of him being suspicious before he got delirious. I understood that he was afraid of almost everybody. Captain Buddington, Dr. Bessels, and even at one time Mr. Chester—the best friend, in fact, he had aboard—he was afraid were going to do something to him. I do not know that he was afraid or even spoke of Hannah and Joe in his delirious moments. He never seemed to be afraid of me before my face. He always thought he could depend altogether on me; but dear knows I don't know what he said when I was not present. He may have said I was going to kill him as well as anybody else, for all I know. He said somebody "had a gun over there." There was no gun there. I hear of his thinking he saw a sort of blue gas coming out of people's mouths. He never struggled with me when I tried to assist him. I heard him struggle with others. I heard Captain Buddington trying to put him in bed when he wanted to go out. I was in the lower cabin, turned in, when I heard it. When I had waked and turned out things were quiet. I heard it, but I did not see it.

Question. Had he taken any medicine, or anything, before the vomiting?

Answer. No, sir; nothing but the coffee which the steward brought him from the cook's galley.

Question. Who gave him his medicine generally?

Answer. Dr. Bessels. I never gave him any. I don't know whether Captain Buddington did or not. I think he did, because he appeared to take it from him. He was opposed to taking medicine from Dr. Bessels when he was delirious. I do not think he took much medicine. He was apparently better for two or three days. He seemed very smart, indeed, and we all thought he was better and going to be the same as usual, and would be able to take the journey which he contemplated to the southward in a day or two. I think he ate some cooked hare that day. I think the doctor objected to him eating so much as he would wish to; but he did eat a good deal for a man that was so enfeebled and sick; for instance, he ate a thigh and leg of a hare, or something like that. I was not present when he was taken sick the second time and had his relapse. That was at night, but it was not my watch. Mr. Chester must have been with him then.

Question. Did he take any more medicine the day that he appeared to be well?

Answer. No, sir; not that I know of. I believe he stopped taking medicine. I think these expressions of suspicion and distrust of various people were the expressions of a man in delirium, and I have no cause to think otherwise. He never spoke of them in his sane moments to me, or anybody that I know of.

Question. Have you any reason to suppose that there was any foul play toward him?

Answer. I have not, indeed.

Question. Did you think so at the time?

Answer. I did not; it never struck me.

Question. Do you think so now?

Answer. I do not.

Question. Then you consider these expressions of suspicion by Captain Hall the ravings or hallucinations of a man out of his head?

Answer. I do, sir, and I hope so.

Question. Have you any reasons to believe otherwise? If so, state them.

Answer. No, sir; I have not. I have no suspicion to the contrary, and never had, except the reports that I have heard around. I never formed one myself, and never had one. I never had any reason for suspicion or doubt. Dr. Bessels was as kind to him as anybody I ever knew, while attending to him, and administered, I suppose, to the best of his ability, and I saw no reason to suspect or distrust him. I was the only one that was present when he breathed his last. He was in a heavy sleep as I thought, lying with the side of his face on the pillow, his mouth and side of his face down in the pillow. I sat by his side, and he breathed very heavy, and Mr. Chester remarked to me, "He is asleep, and I don't think he is any better; he is very bad." Chester turned in; and after a while I spoke to him, but he made me no answer. I raised his head with my hands, and I saw something about his mouth—saliva about his mouth. I then turned him partially on his back, and put his head a little more upright, wiped his mouth, and put a teaspoonful of some kind of drink between his lips, but he never noticed it. I don't think he swallowed. I had to wipe off the saliva and clean the side of his mouth then. He remained in that position then for some time, breathing shorter all the time, and finally I had to listen to him. At about 20 or 25 minutes past 2 o'clock, when I was with him, he ceased breathing. I kept my cheek close to him, but I could not hear any breathing. I went immediately and shook the doctor and woke him, and told him the captain was dead. I had to call him twice, and he could not comprehend thoroughly. I said, Captain Hall is dead. He jumped out, and I then went down to the lower cabin and called Captain Buddington, and told him the captain was dead. Afterward Buddington called Tyson and Chester and the rest. Chester and all hands were turned in below but myself at the time. There were six or eight people in the upper cabin, but they were all asleep. When they came up Captain Hall was dead a minute or so. While he was in these last moments his face was very placid. There were no contortions; nor was it red and flushed; it was pale, sallow-looking, as when he was alive. After he was dead we dressed him, and made him ready for burial. He was left in the cabin until a coffin was made in the fire-room below by the carpenter. When it was ready, we put him into it, took our last look at him, nailed the coffin-lid down, and put the coffin out on the poop-deck. During this time we were making a grave. Tyson, Chester, myself, and several men were hard at work two days digging it out of the solid earth, which was just like flint, with crowbars and pickaxes. We finished it, and on the second day, the 11th, we carried him there and buried him on a flat piece of table-land on Polaris Bay, opposite the ship's winter-quarters. Regular service for the dead was performed by Mr. Bryan, the astronomer, a son of the Rev. Mr. Bryan. The service was read by the light of a lantern held for that purpose. It was dark then—the arctic night. After Captain Hall's death, it appears that there was divided authority, as near as I could understand. I heard that Dr. Bessels had authority, and Buddington went among the men and made very free with them, and of course told them he was captain also. But I always recognized

Captain Buddington as the captain of the ship. There was nobody who questioned his authority as captain of the ship that I know of. During the winter we got along very well—peaceably together. There was nothing of importance occurred that I know of that is worth mentioning. I might think of something if my mind was directed to it. The ship broke adrift after awhile, after we banked her up. We banked her up to keep the frost from penetrating to the interior of her. She broke adrift in a gale of wind, and fortunately she drifted against Providence Iceberg. That saved us from going out into the pack and probably being lost, or driven it is impossible to tell where. We made fast to that berg during this heavy gale and darkness. In a couple of days afterward the young ice formed outside of us. It was several inches thick, and Captain Buddington had that sawed out, and a bed made for the ship a distance from the iceberg—a safe distance, as he thought, for the winter. Shortly afterward, when nicely frozen in, a gale from the southwest came on, and drove the pack against this iceberg, and drove the iceberg in-shore with it, and right up against our vessel—in fact, drove a spur of the berg in under our bows. She lay in that condition all winter, and at low water, at the fall of the tide, this forward part of her would rest on the spur of the berg. It made a cradle for itself in on the spur; and at low water she would keel over, and at high water she would come up again. She was going that way twice in twenty-four hours during the winter; and when the spring came, and the ice began to melt about her bows, the water began to come in in a stream, and we found, then, that her stem was displaced, and a crack at the six-foot mark came from her stem as far down as we could see her—seven or eight feet. She had been wrenched on the berg, and her cut-water slewed to one side, and opened on both sides. There were attempts made to prevent the water coming in, but they did not succeed. Then we made a water-tight compartment, but the water flowed over the bulk-head, and in among her upper works and down through her timbers.

The attempts that were made to relieve us of the water failed, and then we had to put the donkey-pump to work to keep her free. The water came in steadily and constantly. After the ship broke loose, the first time, we certainly could have taken her back to the old floe from which she had broke off. Part of it stood there, and was not more than one hundred yards, but it was my opinion that she was safer where she was, if the iceberg had kept a certain distance from us; but when the iceberg came up to us, I have no doubt that if she had been taken away from there at the time, that she might have been prevented resting on it; but I do not know that there was an effort made to do that. She rested there during the winter. During the winter I never left the ship except to go on shore for provisions, and then came right back again. I had charge of the provisions until Captain Hall died. I did not have charge afterward; I found it would be an unpleasant situation, and I gave charge to Captain Buddington, with the keys, and resigned. I did not have anything to do with provisions, clothing, or anything of the kind. Captain Hall had previously given me charge of all these things. I had a knowledge of accounts, and was familiar with these things, and I suppose it was for that reason that he gave them to me.

When the spring opened, we got all our provisions from the shore, and put them on board the ship again, and we resumed the summer rooms, and put provisions in the lower cabin, and made everything ready for sea and to pass the summer with. We unhoused our ship, took the canvas off and dried it, and put it away. That being done, on

the 1st of May, Captain Buddington detailed Mr. Chester and Mr. Tyson to go on a boat-journey. In the mean time Captain Buddington and Dr. Bessels had an understanding. One was to conduct the sledge-journey and the other the boat-journey, but the sledge-journey was left to Dr. Bessels, in fact altogether. He had charge of them, I understood, and could do as he pleased, go when he liked, and organize a party when he liked, and so on. But a boat party was proposed by Captain Buddington, and he said he would take charge of it himself. He did not, however. He detailed Mr. Chester and Mr. Tyson to take command of them, and no sledge-journeys of any consequence were undertaken. On the 3d of June, however, the boat parties were ready, and I believe started, dragging their boats to Cape Lupton, a distance of about four or four and a half miles, to Robeson Channel, where there was open water. They started thence some few days afterward. Chester had the mishap to lose his boat in a few hours after he started. It was sunk with everything on board of her. Tyson did not start for a day or two after, but went ahead as far as sixteen miles up to Newman's Bay, and was there stopped by the ice. Mr. Chester returned to the ship and requested the canvas boat, so that he might try again. His party volunteered to go with him, and he got supplied again and started after a few days. He went up to where Captain Tyson was. The party consisted of Mr. Meyer, Mr. Chester, and Dr. Bessels, Captain Tyson, and four seamen in each boat. At this time there had been no sledge-journey made of any account except when hunting-parties were gotten up. They went out on sledges, but the season for sledging was then over. There was no ice or snow on the shore, and the ice in the channel was broken up, and the snow was soft, so that this rendered the season for sledging over. A sledge-journey should be undertaken early in the spring, in March or April at the furthest. In the mean time a gale of wind came up and broke the ice within a short distance of our ship. When we found it so we commenced sawing, and by sawing and heaving the pieces out for several days we succeeded in freeing our vessel. The heave of the sea coming in from the channel, and from the bay, it broke the ice up, and being previously sawed in several places around the vessel, it broke into different pieces and drifted away, and the ship slid off out of her bed in the berg, the same as if she was going off the ways into the water, and so she got afloat again. That was about the 20th of June. We went to sea that same evening that we broke out, and went into the channel. It was perfectly free from ice for a certain distance. The bay was a mass of water all over. There was scarcely a particle of ice to be seen in the channel. We went up there near some of the capes, pretty near to Newman's Bay, to the south cape of Newman's Bay. There we met a heavy pack of ice, with no chance for the vessel penetrating through it. We fired three heavy shots out of our twelve-pounder howitzer in order to attract the notice of the rest of our party if they chanced to be near. I heard afterward that some of them heard the reports but could not understand what they were, because they had no idea of the ship breaking out at that early period, she was so imbedded and surrounded with the hummocks and broken ice and icebergs. We then came again back to our winter-quarters alongside of the berg. In the mean time two of Chester's party came down. It seems that they had got short of bread. This was towards the latter part of June. We were very poorly manned on the vessel. There was only the captain and myself that knew anything about sailorizing. The rest were Mr. Bryan and two firemen and two landsmen, and a few others, with the cook and the steward. Captain Buddington con-

cluded to retain these men, at least one of them, and sent word to Chester that the ship was broken out and making water freely, and that if there was a chance to get north we could do it with the ship as well as with the boats. We finally landed the men with a bag of bread up at one of the capes at Cape Lupton. They were a good while getting to their camp with the bread, and we returned to Thank-God Harbor, and made fast to the berg. We sent Hans before that to tell them, but Hans brought word back, and the doctor came along with him, and then we dispatched some men with the bread to Chester. After that we went out again, but could not get up as far as the boats were, and came back the third time to Thank-God Harbor and made fast in our old winter-quarters again. A short time afterward Captain Buddington sent a note, I think, requesting them—I do not think he sent an order, he was not firm enough in that respect, I believe—but he sent a request to have them return. He made known to them the condition of the ship, and told them that they would be of more use on board the ship than where they were lying up in the ice. A few days afterward Tyson and his party came down, and in a few days after that Mr. Chester and his party came down. We were then all on board the ship again, minus two boats and the canvas scow that was left up in the channel. We did nothing particularly after that. We had a good deal to do to save our vessel. We got aground three or four times, but the ground under us was soft, and we got her off each time. Finally we found there was no prospect of doing anything. The season of sledding was over, and the channel was full of ice. I do not know that there was any consultation about it, but the first thing I knew we were on the lookout for water, to go south with, and were under orders to get under way. We slipped our anchors and did not get either of them, and came down the bay toward Kennedy's Channel. At this time we met a great deal of obstruction by the ice flowing out of Robinson's Straits into this bay. We had a good deal of difficulty in getting along. In some places we would get a lead for a short piece, and then we would be obstructed, and had to bore our way considerably. We could not force the vessel as much as we could have done on account of our disabled bow. She was a fine vessel, as strong a one as ever I put foot on. She was well provisioned, well provided for in everything; she was well supplied in every respect but in regard to coal. She was not able to carry enough coal for such voyage, owing to the long delays to which we are so often subjected, and the obstructions to be met with. Coming through Kennedy's Channel we were beset a few days, but in no danger at all. We finally got out of it and got into Smith's Straits, and had a good prospect of getting home by the fall. There appeared to be a good many leads along the west shore, and a good many running out into Smith's Straits, but a person with any judgment at all, that knew anything about Smith's Straits, would never get out into the heavy pack that is known to exist abreast of Humboldt's Glacier There are innumerable icebergs there, and a pack of ice the whole year around for years. By some mishap—I suppose, it was done for the best—the ship went into a very favorable looking lead out into this heavy pack, and got beset. There was a great deal of effort made to bring her into shore again—to the west shore—but it was almost impossible. We bored and did everything that could be done, but met with no success. We were finally beset and made fast to a heavy floe, or pieces of table-ice—a good large piece that was probably several years old. This was outside of Kennedy's Channel, and up probably in the neighborhood of Cape Frazer, or up at the head of Smith's Sound. We were in sight

of Cape Andrew Jackson, and could see the west end of the glacier at the time. We drifted then continually. Some days we would drift a good deal, and some days but very little. Occasionally there would be a lead of water for a small space, and we got under way several times. On one occasion we went from one large floe to another and made fast to it. This last time we made secure and fast to a very heavy old floe. We were expecting still to get a lead to the westward. Inshore to the west land, not a great way from it, we saw leads of water that if we could have gotten into them we might possibly have got down south and made our way home. We were unable to do so, however. The young ice commenced to come so rapidly now that we finally found ourselves housed in, seemingly, for the winter. The young ice began to make around the ship. We were able to travel over it and go on to this old floe and dig wells. The wells are formed there by snow melting in the hollow; they are sometimes four and five feet deep, and often there are two or three feet depth of fresh water. We supplied the ship with water from them until we finally broke out. The wells are coated with ice, and we had to break a hole in them every morning and get our supply of fresh water for the ship from them. We continued drifting in this pack, drifting to the east shore considerably. We saw the east shore pretty much, at least until we got pretty near Kane's winter-quarters at Rensselaer Harbor. At that time we thought we would be driven in there with the pack. We were not more than thirty or forty miles from the harbor, and we were in hopes that we would be driven in there and there stopped, so that we might winter in safety and be able to break out in the spring again. The ice, however, took another turn and swept over to the other shore in a contrary direction. We went rapidly then down through Smith's Straits and by Littleton Island. That is in Smith's Straits, between Baffin's Bay and Smith's Sound. We went rapidly out through that, and coming down past Cape Alexander, abreast of Southerland Island. We then could see Northumberland Island, probably fifty miles distant, to the southward of us. This occurred about the 15th of October, and on the night of the 15th, early in the evening, between 7 and 8 o'clock, it commenced to blow a hurricane. Before that time we had a house on the ice, and some provisions and some clothing put into it for safety. We also had all our provisions that were required, in fact, put on deck—some aft and some forward—and five tons of coal. On the night of the 15th of October it commenced to blow, and the ice outside of us, that formed since we got beset, moved away. It left one side of the vessel all water. The ice finally came in from the outside of us; that is, the ice that receded from us came in again and nipped us severely and canted the vessel over considerably. On this occasion there appears to have been a flow of water below, that ran from one portion of the vessel to the other. The engineer ran up and reported that she was badly nipped on the quarter, and that she was stove in, and that the water was rushing in from aft. Captain Tyson got that report, and in my hearing told it to Captain Buddington. Thereupon Captain Buddington ordered the provisions and things that were prepared to be got overboard, to be taken on the ice, and ordered a certain portion of the people out to receive them. I thereupon went aft, where there was a great deal of provisions, and Mr. Bryan was with me, and Mr. Chester, with the other men forward, and some of the men were at the pumps—at the small alleyway pump. It took a few men to relieve each other at that, and then we commenced putting provisions and stuff overboard. We had nearly completed all this, and we were all, in fact, intending to go on the ice

for the purpose of waiting to see what would turn up, at least. We knew that, even if all the hands were on board the ship, we could not save her through the winter. We knew that the pumps would freeze up; and we had not coal enough to keep her going during the winter season. We felt that we would have to let her sink under us. That was my opinion, any way; and I think the others entertained the same opinion. If we had had coal enough we might have saved her. If we had been able to pump her all winter we could have saved her. When we had almost everything done, and just waiting for a few moments just to see what would happen, her stern-hawser snapped and broke. It pulled out all its fastenings, and then the strain came on the other one, around the main one, and it snapped also. She swung off, and the whole strain came on the bow-hawsers; but in some way or other that parted. Some say that that slipped, or that the ice-anchor drew. Anyhow, we did not get the anchor on board, but we got the hawser. It was blowing such a terrific gale from the southward that we went like a shot out of sight, and did not know where we were going at the time. We wanted to be on the ice, and it appears that some of the men on the ice wanted to be on board the ship. I would have preferred being on the ice, regarding that at the time as the safest place. All our effects were on the ice; all our clothing. We had not a stitch except what we had on. There was some bedding, and some clothes the crew left, but that was all. We fortunately had some provisions, about enough, but not much more than enough, to last until spring. The bulk of our provisions and clothing, and everything that we had, with about twenty musk-ox skins, were out on the ice, and we were very sorry we could not be there with them. We thought the ice was the safer place of the two. I do not think there was a man on board the Polaris but thought this, and I think the men on the ice thought so too at the time. They were anxious enough to be out there; but some people had to stop on board and send the things out of the vessel. When we drifted out the donkey-engine was not going. The engineer was ordered to get up steam on the little boiler as fast as he could. He did so by burning everything he could lay his hands on. The water was still making on us, and coming up near the furnace. The donkey-engine was out of order; but there was hot water in the boiler, and we put the boxes in the deck-pumps and poured buckets of hot water into that and thawed it out. The deck-pump is a powerful pump. It is able to force out a great deal of water. We finally got it to working, and that actually saved our lives. It could not save the ship, but it saved our lives. We pumped the water out of the ship, but it would not run off the deck readily, and came around our legs, and got solid where we were standing; and we had to shove it back so as to give the other an opportunity to come out. It was all forced up on deck in a slushy state. We continued at that until Mr. Schuman reported steam; and never were men better pleased in their lives than we were to hear that steam was up, thus knowing that we would be able to keep her free. It was like being rescued from death almost. When we got up steam we were able to pump her by steam. In the morning, when day dawned, we found ourselves up Smith's Strait, north of Littleton's Island, and some three miles or three miles and a half from the shore. There happened to be a "lead" of water inshore from us. The wind then continued at this time to blow a little, not a gale, but a nice breeze from the southeast. We commenced to drift down again out from the pack from where we drifted the night before. We made every effort to get into this "lead" of water. We could not keep the ship afloat long. We found there was no use in our trying to save the vessel; and

if she had gone down where she was we might as well have gone down with her. We could not have saved anything, probably not even our lives. We made every effort we could by sailing; and Schuman, every two or three minutes, would use the steam, which he would keep up for two or three minutes, in order to give the vessel a little push ahead. The little boiler was not able to keep steam in her. We finally succeeded in getting into what was formerly known as Life-Boat Cove, where Kane buried his life-boat, going up in 1853. I knew the place the moment we landed there, on account of its vicinity to McGarry Island. In the mean time the first thing that was done was going to the "crow's-nest" and the mast-head. As soon as daylight came, and very often afterward, Chester went up to the mast-head, but said he could see nothing. He saw a black speck on the ice, but he could not tell exactly what it was. It was not moving, however. He thought at first it might be barrels, but we came to the conclusion it was the shade of a piece of berg or hummock. Then Henry Hobby, I think it was, the man who previously was on the lookout very often, went up to the crow's-nest during the day for the purpose of seeing our people if they were in sight, but no vestige of them was to be seen. We finally succeeded in the evening in getting the ship in as near shore as possible. It happened to be high water, and we made her fast to the grounded ice—I mean those heavy floes that rest on the shore, and that sink down and go to the shore at low water, and float at high water, and that are driven out sometimes. With a whale-line that we had on board, and a piece of hawser, we made her fast to the inside of the floating pieces of ice, to the ice that was fast on the shore, and at low water she rested. She took the ground. She was several feet out of the water then at her bows; and we went and examined her, and her stem was completely knocked off. I wondered how she floated so long. She could not have stood long in the condition she was in if she had had anything at all to contend with. Her stem was completely knocked off, and a split as far as eight feet along her bows where the old wrench was. We were only too thankful to get in. We commenced immediately to take down our sails and spars in order to build a house on shore. That was commenced at once. After we got them off we conveyed them ashore. Mr. Chester, the carpenter, and Booth, I think, went to build the house, and I went with the rest of the party and commenced getting everything out of the ship. What provisions were left, and everything that was movable, were brought ashore to where the house was built. We were several days at this work, assisted by the Esquimaux, but we were able to sleep in the house the second night. The Esquimaux came the second day. Two of them I was formerly acquainted with, Myonk that was with Dr. Kane awhile. He was an old acquaintance of Dr. Kane's. I went out to meet them on the ice, and I recognized Myonk. When I spoke to him a few words as well as I could, he recognized me, and I brought him on board and introduced him to Captain Buddington. He stopped with us a few hours, and helped us with their dog-sledges to drag the things across the ice. We had a great deal of difficulty in doing so, and fell through a good many times. He went down to his settlement, and the next day we had five or six sledges up. We went to work, and in a very short time we had the vessel stripped and nearly everything ashore. We then made arrangements for the winter. We covered our house with the sails and got our coal on shore, which was six tons at the most, and what spare wood was about, and covered that and our provisions. We built an outside shed for them to save them from the inclemency of the weather. The Esquimaux staid by us all this time

until everything was arranged. A few days afterward Captain Buddington made them presents of what materials we had. We had a great many spears, harpoons, and things of that kind, and needles that were left on the ship. The best part of our trading articles were in the large chest that Captain Hall had for trading purposes, and it had been put overboard. It was a great loss to us—in fact it was a loss to the Esquimaux, because it would have been of great benefit to them. Then after that we commenced our winter on shore. We were comparatively comfortable. We had berths all around the sides of the house. We covered the top of it with snow to prevent the frost coming in, and we put a stove inside of it, and a cooking-stove adjoining the outside door, and Dr. Bessels and the scientific gentlemen put up their scientific apparatus and attended to them during the winter, and thus time passed. We collected ice from recent icebergs convenient to the house to melt water for drinking and cooking purposes. Our coal gave out with the exception of two bags that we kept for blacksmith purposes, that is, to build our boats with. We did not use them all. Some of them were left there in our winter-quarters.

In February we had to resort to the ship; by lamp-light in the first place. We took her spare rudder and sawed that up for fire-wood, and we took her bowsprit out of her, and then the masts, and then we took her house away, first selecting the boards for building the boats; in that manner we provided ourselves with fuel until we came away. Mr. Chester commenced to build his boats. The weather prevented him a great deal. Some days he could work for a few hours, and some days he could not do anything. It was very cold until late in the season, but he contrived to build two admirable scows. They were very well built indeed. They were better than I expected to see. In the mean time Dr. Bessels collected some particular things that he wanted saved. I dis-remember what was in that box now. In fact I never was acquainted with its contents. There were three boxes left up on the hill in a cairn there. They were left in charge of the Esquimaux. There were presents given to the Esquimaux too. Some of them remained permanently with us, almost all winter, and at the time we left there there were two families there. They were threatened that if they touched the things we left they would be badly dealt with; that they would be punished. They said they would not. After that we were ready. We got our provisions in the boat. We had them previously made up and provided while Chester was building the boats. I was superintending, under Captain Buddington's directions, the putting up of the stores to be carried in the boats, and a certain amount of clothing. We had not a great deal. There was only a certain amount allowed. The 1st of June was our time for leaving. There was then a gale of wind. The next day was Sunday. The gale continued on that day, but on Monday morning, I think it was, we started. We had open water round Cape Alexander and down to Etah Wetany. We passed through and tried to get further down toward Northumberland Island, but had to come back there again. We wanted to follow the shore but found pack-ice in there. We came back and remained that night at this Esquimaux settlement. The next day we had to go out in the bay, outside of the ice, through a lead, through an innumerable row of icebergs, sailing in and out through them to Northumberland Island. The distance between where we were and Northumberland Island was more than thirty miles, but we made it rowing and sailing.

When we had a fair wind we could make a good way sailing, but

when we had a head wind, or a calm, we had to row; we made Northumberland Island late that night—somewhere about midnight.

That was a good day's journey. It was Hakluyt Island where we rested. We remained there for a couple of days on account of bad weather, and then went over to Northumberland Island. There was a good deal of ice in the vicinity, and we made two or three attempts to leave it, but could not, and we rested on Northumberland Island in two or three different places. We finally started across to the main-land, toward Cape Parry, but we got beset and stuck in the ice, and drifted a part of that day and all that night in the pack, and in great danger of being lost. We were drifting out, heading our boats on a small piece of ice that dritted out into Baffin's Bay. But we finally succeeded in carrying our provisions from one piece to another, and our boats afterward to the same, and so on, until finally we got to a lead of water, and succeeded in getting to the place we left the day before, in the same spot. We again started after a short rest to the main-land, and succeeded in getting past Cape Parry. We went along the shore then toward Sanderson's Island, and went on to Wolsteinholm's Island. We remained there a short time to bivouac, and finally came past Cape Dudley Digges and Cape York. We got south of Cape York, having had in the mean time a great deal of difficulty with floe-ice. We succeeded in getting some twenty-five or thirty miles southeast of Cape York, in Melville Bay, when we were obstructed again by the heavy pack. We were alongside the fast ice, but the broken floe-ice was close against it.

About this time one of our boats got injured, but not very badly, and we repaired it. While here contemplating what we would do next we espied a whaler some ten or twelve miles distant; we sent two of our people to communicate with them, and tell them of our situation and who we were. Before they reached the vessel, there were a number of men dispatched from the vessel coming toward us, some twelve or fifteen. On meeting with our people two of them went back to tell the captain of the vessel who we were; the rest came on. That evening we started, with what effects we had or could carry, some small things needful, and, assisted by the crew, we got on board the Scotch whaler Ravenscraig, of Kirkcaldy. That is the name of the place in Scotland where she belongs, though she sailed from Dundee. Captain Allen received us very kindly and attended to our comforts, and was assisted by the surgeon of the ship, whose name I cannot now recall. We were very thankful for the kindness shown us, and for falling in with these men, because there was difficult work before us. It was very doubtful whether we should ever reach Upernavik. Our boats could not stand a nip; they were very slightly built, and our provisions we were afraid would give out before we got there. We had only just commenced our journey, and we had the most difficult part of it to do yet. After we got on board the whaler, everything was comfortable and pleasant. We felt greatly relieved because we thought that we were safe. After the ship got out of the ice and over on the west shore at Lancaster Sound, on account of the small quantity of provisions that he had for such a number, the captain distributed us to different vessels. He sent some to the Arctic, some he kept on board the Ravenscraig, and some were put on board the Intrepid. Afterward, when the Arctic got filled with oil and was returning home, we transferred ourselves from the Ravenscraig to her, went to Dundee, and came home from Dundee to the United States by way of England, reaching here in the City of Antwerp. Three of our number were left on board the In-

trepid—Mr. Bryan, Mr. Booth, and Mr. Mauch. It is nearly time they arrived now. I expect them almost every day. It is nearly time, because there was another ship about coming home very soon, or about the same time that we did. All that she wanted was one whale, and probably she may come without it. There was also another ship leaking badly, and the captain said he had reason to come home, and probably started about the same time that we did, and if they fell in with either of these ships they are nearly home now. They cannot be much longer away, because the whaling-season is past, and they must leave whether they have whales enough or not. They would not be likely to winter up there; they are not prepared for winter; they must leave before winter sets in.

I have given you an outline of our proceedings and adventures as far as I recollect. I kept no journal. Perhaps once in a month I would note down in a pocket-book one little incident or another, but that was all. It was a little book, and I did not care anything about it. I understood by report that there was something similar to it picked up on the ice. This little book, which was a little book with a leather cover not unlike a bank-book, was found on the ice after we had started from the party on the floe, and that is similar to the one I had.

(The printed volume of testimony containing statements of the parties on board the Polaris being shown to Mr. Morton, and he being asked if the extracts which purported to have been written by himself were his and were correct, he said they were, but that he did not expect them to be seen by anybody when he made them, having just written them down for his own use.)

Question. Have you looked at this chart of Mr. Myer's?

Answer. Not very minutely.

Question. Look at this chart and state whether it is generally accurate.

Answer. I think it is. As a matter of criticism, I should say that Newman's Bay did not appear to me from the ship on the day we passed it to be as wide as it is laid down on the chart, and it seems to me that Polaris Bay is not as much of a bay on the chart as it really is.

Question. You are the very man of Dr. Kane's expedition who was at Cape Constitution?

Answer. Yes, sir. Hans Christian and I were there for Dr. Kane. We were both on board the Polaris on this expedition. We partially recognized Cape Constitution as we went up, but we were certain of it when we came down.

Question. Is it correctly laid down on this map?

Answer. I should say it is. It appears to me, however, that Cape Andrew Jackson is nearer to Cape Constitution than is represented on he map.

Question. Do you think Cape Constitution is put in the right latitude on the map?

Answer. I dare say it is. When I went there for Dr. Kane I considered it by dead reckoning to be some forty miles up the channel from where I started. I made no survey this time. I merely looked on. Cape Andrew Jackson appears to be farther down than I supposed it to be, but coming down we recognized Cape Constitution to be the same place that we supposed to be it going up, and we saw the exact spot where Hans and myself killed two bears when we were on Dr. Kane's expedition. I do not know whether its latitude is accurately laid down on this chart or not, but the same place that we supposed to be Cape Constitution as we went up is the Cape Constitution I visited with

Hans, and it bears the same relation to the rest of the shore-line as is shown on this chart. I could not have been accurate when I was there first in regard to the latitude. I had only received a lesson in taking observations from Dr. Kane and Mr. Songstag before I started, and I was only an amateur; by no means a proficient. But we recognized the place this time, particularly as we came down, as the same place at which Hans and I were then, and although I cannot be certain as to the exact accuracy of the chart, it bears in reality the same relation, so far as I can see, to the coast-line above it as laid down here.

Question. Do you remember Kane's chart?

Answer. I have only seen it once, and it was a long time ago, when it was newly made. It has been revised since I saw it.

Question. Do you remember on that Kane's chart, where you put down Cape Constitution, land breaks right off to the west?

Answer. That was only a supposition that it broke right off, because we did not see it. We did not get far enough in front of the Cape to see around, and it was only a supposition that it broke off.

Question. Do you remember that what is now laid down in this chart as land on this shore above Cape Constitution was laid down as water on Kane's chart?

Answer. Yes, sir; it was supposed to be water. The land was not seen at that time. In sailing up this time we discovered that instead of water above Cape Constitution, there was land more than thirty miles above up to the opening now called the Southern Fjiord, or above that, on the shores of Polaris Bay and Robeson Channel.

Question. After Captain Hall died, did you hear anybody express himself as relieved by his death?

Answer. I did not; but I thought some people were not very sorry. I did not indeed hear any such expressions I never heard Captain Buddington say that he was relieved, but I heard within the last few days that he did say so; I did not hear it myself. The discipline of the ship was good during Captain Hall's life-time. He was a very kind man, but strict. There was nothing tyrannical about him. Still everybody appeared to dread him and respect him. That was my feeling toward him. I did not dread him, but respected him very much; I was an old man-o'-war's-man, and discipline was familiar to me; after he died the discipline was loose, and every person did almost as they pleased. Still, I saw no bad actions, or acts, committed. Captain Hall and Captain Buddington during Captain Hall's life-time occasionally had a few words. Still, there was a good feeling between them. They appeared to be indebted to each other for favors and kindnesses. Still, Captain Hall had a few words with him—I suppose in the line of discipline, and things of that sort, on two or three occasions.

Question. Did you ever hear Captain Buddington depreciate Captain Hall among the crew?

Answer. No, sir. I have heard him mutter to himself inarticulately several words. I did not want to listen to what he was saying, but I knew they were a little disrespectful to Captain Hall.

Question. Did you ever hear him talk among the men disrespectfully of Captain Hall?

Answer. I did not; but I understood he did. He has used a good many careless expressions that I did not take notice of. He was very foolish in a great many of his expressions; and I did not think the man meant what he said half the time. I saw him under the influence of liquor a couple of times; but could not swear that I saw him incapable of doing his duty. I know that he was boozy and intoxicated, but still

a man can do a good deal when he is even that way. I never saw him lying down dead drunk. I heard that he had some difficulty with the doctor about the alcohol. I heard a slight altercation between them. I was in the upper cabin, but this happened, I understand, in the lower cabin. I was told it both by the doctor and by Buddington himself. I was told that the captain was tippling on alcohol; and the doctor proposed to watch him, and hid himself down in the lower cabin, in Hans's quarters, and he lay there in ambush until the captain came down, when he had a little bottle secreted there, and as he came down there and took his nip, the doctor sprung out upon him and wanted to snatch it from him, and Buddington got hold of the doctor. I do not know whether one of them fell or not. But such a thing happened between them, I understood, and I think I heard the scuffle going on; but I was not present at the time. It was told by both of them afterward.

That night after we left winter-quarters and were coming home, when we left the west shore and got into the middle of the channel and were beset, I cannot say that he was drunk, but he had been drinking. I saw him able to give orders and work on deck, but I should think that he had been taking something. I know Captain Hall kept a journal, but I do not know what became of it. I saw it after Captain Hall's death, but I have not seen it for a long time. It was kept in his desk. It was in a large book like this. (Referring to one of the regular printed Navy journals.) After his death I saw some people reading it. I think I saw Captain Buddington and others read it. I disremember who else; perhaps Mr. Chester; I am not sure. I do not know whether any others read it or not. I saw them reading it in the cabin. This was not very long. It was, I understood, put away among his other papers. They were put, I understood, in a tin box. He had a writing-desk and a tin box with a lock and key on, and Captain Buddington put his papers in it and kept the keys of it. That box was on the ship until the evening we broke away; after that I do not know what became of it. I did not see it. It was not in the ship after we went ashore. It was in the cabin aft, I suppose, and Mr. Bryan and I were aft at the time the ship went adrift putting the things off, but I do not remember of putting that box over. I am sure I did not. We put pemmican and other boxes of meat there, and clothing and bedding, &c., and a heavy bag of ammunition, with powder, shot, and every other thing in it, I had prepared and laid in the wheel-house, but I am sure I did not handle that box to put it out. Somebody else may have done so, but I did not. I did not see it afterward, never. I would know it if I had seen it. I have never seen it since that time. It was a japanned box, with a padlock and key on it. I did not see anything of any of Captain Hall's papers after that. I saw his papers frequently in Captain Buddington's hands, just merely to replace them in his box, but I have not seen any of Captain Hall's papers since that night. I do not know that any part of the journal was burned. There was something burned, but I do not know that it was any of the journal. This was a few days or probably a day before Captain Hall died. I understood that it was burned over a candle in the cabin by Captain Hall in the presence of Captain Buddington. I heard this from Mr. Buddington himself; that Captain Hall had written a letter against Captain Buddington, and that he said that as long as he intended to destroy it, it was not worth while that he should read it. He said that it would only leave something bad in his memory, and he would destroy it. It was burned. I saw the burnt parts of it on the table that the candlestick was on that night.

Question. Have you any way of accounting for the fact that you did not see the men on the ice the next morning after you went adrift?

Answer. I have no idea. They must have drifted. There appears to be no doubt about the fact that they saw us. They all saw us, it seems. And there is no doubt about the fact that we did not see them; I am not able to give the reason, unless they were under the lee of Littleton Island; they may have been one side of it and we the other, and we could not see them on account of that. They were low down. Mr. Chester and other men went frequently up to the crow's-nest, but did not see them. Captain Tyson could not have known where he was, or he would not say we were at Northumberland Island. We were not at Northumberland Island. We were sixty miles from it. We didn't go an inch in the direction in which the party were. We went directly in to the southeast—directly ashore as near as we could and toward Littleton Island, not more than two miles above it. The only reason I can give that we did not see them was because they were in toward the east shore under the lee of Littleton Island, and we were to the north of it and the island was between us. It is a high island. They might see us, because we were a larger object, but we could not see them. They might after we got in near the shore have seen us in the space between Littleton Island and the mainland. There are two or three miles of channel there. They say they saw us twice as we came down, and afterward when we got into this open channel, but we did not come down. We headed in to shore directly as near as we could. We might have drifted down a little. We did not head down, and tried to avoid going down. We knew that there was no help for us, if we drifted down or did not get this lead into the shore. We could not do anything more than we did do to get the vessel ashore.

Question. If you had seen them you could not have gotten to them?

Answer. We could not indeed.

Question. How much of the time were these men at the mast-head?

Answer. They did not stop very long at a time. They scanned the horizon, I suppose, for ten or twelve minutes at a time.

Question. Were they there half the time in all?

Answer. No, sir.

Question. How much of the time were the men at the mast-head altogether?

Answer. Probably an hour altogether. They would go up and take a scan around, then come down to their work. We were very busy on board of the ship, and all hands had to be to save her. I do not think the men were up more than an hour during the day. We went to work at once to take care of the ship and to get her inshore. When we left Life-Boat Cove we left nothing there worthy of note—a lot of *débris*, old books, &c. They might have been valuable if they were taken care of. We had not the means of transporting them home. The original log was copied into a smaller book, and the copy was brought home, and I think that the original was put into the box, and left in the cairn on the hill up there. There were also some boxes of specimens left there, and instruments.

Question. When Captain Hall had his relapse, what were the symptoms; did he vomit in the first case?

Answer. I think not; not while I was in his presence.

Question. In what way did the renewed illness manifest itself?

Answer. He merely appeared to be like a person who is incapable of using his limbs—helpless almost.

Question. Did that seem to come on suddenly?

Answer. It appears it came very suddenly. He was up to-day, and down to-morrow. I do not know whether it came with a stroke. I was not with him at the time. Mr. Chester was with him. It appears that he took something—medicine of some kind; but whether that was the cause of it I do not know. Of course it was not really the cause.

Question. What induced him to take medicine; because he felt an attack coming on?

Answer. I don't know. I was not there. After the second attack he appeared to be numb. In fact, there appeared to be a general numbness or debility all over him, as far as I know. I did not notice one leg or arm more than another. I paid some attention to the natural history of the expedition. I pulled a great many little flowers, mosses, and picked up a good many stones, and I put away some of them, but I lost them all. I saw some of the drift-wood. It was picked up in Robeson Channel, and brought down to the vessel. I saw it on the poop. I believe it was found on the shores of the main channel of Robeson Channel above Polaris Bay. I only saw what was brought in. Two large pieces of sled and pieces of wood of a pretty good thickness, for wood that grows in that country. I would suppose it did not grow in that country. Upon the question as to whether the tide came from the south or the north, I heard some of them say it came in from the north, but my opinion is it came in from the south; but there was a continued drift from the north. I noticed that. This drift was generally to the southward, whether the wind was blowing or not, in the center of the main channel. I might have seen ice going up for a short time, but it was always sure to come farther south, and generally turned to the south altogether. I saw a good many musk-oxen. I did not see any the second winter, not even in Kane's winter-quarters, which is higher than Life-Boat Cove. He saw the skeletons, but no live ones. But around Newman's Bay there were a good many herds of them. They feed on grass that grows there, and willow that grows there in the summer season. They paw it out in the winter season from under the snow and eat it. I did not see any wolves, but I saw white foxes, hares, and a great many ptarmigans. We could go and catch lemings. I brought in five myself from the shore and had them all aboard for some time. They are innocent little things; they would run away from you, but you could go and catch them without much trouble. They would go under the rocks. They could not burrow down very far. They have hills in the snow in the winter, and have nests made there like a bird. Birds flew there that looked very much like hawks; dark brown in color and as big as chicken-hawks. I think we also saw a good number of ravens at Life-Cove Bay. I am not sure; I do not know whether we saw any at Polaris Bay or not. We saw little brant geese. They were small, not bigger than a domestic duck, but they looked bigger. They had nests there. I do not know that anybody saw their nests, but we saw their young when they came down. We did not look much for them, but we saw a good many of them. They fed along the water's edge, probably on shrimp, and I think on the grass. I did not see any fish, but I saw a good many shrimp, if you call them fish. I think we saw jelly-fish, but I am not sure. There are a great many seals there, a couple of kinds at least. I am not well acquainted with them, however. They feed on shrimp. We saw some northern lights, but not so bright as I saw them down at Rensselaer Harbor formerly. They did not appear to be so bright up there. During the winter we had some very calm and quiet weather; we could see across to the west land from the top of the hills during such weather. During the winter we occasionally saw a great deal of

open water. At Life-Boat Cove the last season the temperature was not as low by any means as Kane had it in Rensselaer Harbor. I do not know certainly whether it was much lower than it was in Polaris Bay, but I have an idea that the climate is milder at Polaris Bay than at Kane's winter-quarters. There is less snow at Polaris Bay. The land is entirely bare of snow in the summer season. Down to the south and west there is more snow. It is only at prominent points and headlands where the snow goes off, and all the rest is solid snow. The climate was really milder higher up—in the eighties, than down in the seventies, and there was more vegetation; there must be more vegetation, or musk-oxen could not live. I saw places where they could not exist down a great deal farther south than that. The ice was too thick, and there was no vegetation or anything under it, while at Polaris Bay you would find grass in patches as high as your ankles. There was good feed, and there were young willows that grew up there to a considerable height, some more than a foot above the ground. Down lower, I never saw any more than a couple of inches above the ground; they would spread out over the surface and die away. I think, altogether, it is milder farther north, and there is more vegetation than there is a great deal lower down. Our sensations of cold at Polaris Bay were certainly no greater than at Kane's winter-quarters. We were obliged to muffle up very warmly when we went out during the winter, particularly if it was blowing. If it was blowing at 10 below zero it could not be stood as well as when it was 50 degrees below zero and not blowing. To take any exercise in calm weather, when it was 40 degrees below zero, you would not be able to muffle up much; still, at the same time, your ears, and nose, and fingers, and flesh on your cheek-bones were liable to be frozen. You could not feel it yourself, perhaps, but it would be perceptible in the color of the skin. It would become white, and you would have to get your blood in circulation by rubbing the part affected.

The examination of witnesses having been concluded, the commission adjourned until to-morrow morning at 11 a. m.

WASHINGTON, D. C., *October* 16, 1873.

By invitation, Surgeon-General Barnes, of the United States Army, and Surgeon-General Beale, of the United States Navy, were present to listen to such portion of the statement of Dr. Bessels (who, it was expected, would be next called) as related to the sickness and death of Captain Hall.

Examination of Dr. Emil Bessels.

I was born at Heidelberg, in 1844; graduated at Heidelberg; joined the Polaris expedition at Brooklyn as chief of the scientific department; left New York with that expedition on the 29th of June; next day at noon arrived at New London; left New London on the 3d; on the 11th landed at Saint John's; left Saint John's again on the 19th, making our way for the coast of West Greenland; we arrived at Fiskernaes on the 27th of July to look for one of the natives, Hans Christian, who had accompanied the expedition of Kane, and had been taken back by Hays. We left Fiskernaes after two days, and in going to Holsteinberg we encountered a gale. We arrived at Holsteinberg on the 31st of July. We there met the Swedish expedition, under the command of Captain Van Otter, and obtained some very valuable information in

regard to the state of the ice at the north and Upernavik. We remained at Holsteinberg until the 3d of August, when we left and shaped our course to Disco, where we arrived on the 4th of August, at 3 in the afternoon. Finding that the inspector was absent, Captain Hall dispatched a boat, under the command of Mr. Chester, to look for him at Jacob's Haven and Rittenbenk. On the 10th of the same month the steamer Congress arrived. We landed one part of our stores and took the rest of them on board—as much as we could carry.

During our stay at Disco there was a little difference between Captain Hall and Mr. Meyer, and then between Captain Hall and myself. Some kind friends wanted to make out that we had a mutiny on board of the ship. But the whole amount of it was that Captain Hall wanted Mr. Meyer to write his journal, and Meyer did not want to do it. Captain Hall intended to discharge him, and spoke to me about it. I told him that I did not think Mr. Bryan and myself would be able to perform the whole of the work to be done on an expedition like that. I told him I preferred to go on shore myself if Mr. Meyer was dismissed. I saw that we would not be able to do the work. Finally Mr. Meyer agreed to conform to the orders and instructions of Captain Hall, and the matter was settled. Happily, I am able to produce to you the original copy of the original instructions belonging to Captain Hall. I found it when the vessel broke adrift, and here you will find a statement on this page in Captain Hall's own handwriting. I think it explains the matter. (Dr. Bessels produces copy of the original instructions of Captain Hall, containing a memorandum in Captain Hall's own handwriting, and signed by Mr. Meyer, on the 16th of August, 1871, it being a memorandum made at the time of the arrangement of the difficulty. It is written on the sixth page of the copy of the original instructions belonging to Captain Hall, and marked with his name in his handwriting. It is as follows: "As a member of the United States naval north polar expedition, I do hereby solemnly promise and agree to conform to all the orders and instructions as herein set forth by the Secretary of the United States Navy to the commander. Signed, Frederick Meyer, observer, United States Army. God Haven, Greenland, August 16, 1871." This memorandum is written opposite the following clause in the instructions, which is underlined in pencil by Captain Hall: "All persons attached to the expedition are under your command, and shall, under every circumstance and condition, be subject to the rules, regulations, and laws governing the discipline of the Navy, to be modified, but not increased by you, as the circumstances may in your judgment require." Paper is marked by Secretary, No. 1, E. B.)

After having taken some dogs on board, we left Disco on the afternoon of the 17th. We arrived at Upernavik on the 18th, staid there for three days, and dispatched a boat to Proven to get Hans, Kane's Esquimaux, and on the 21st, at 8 p. m., left the settlement, Governor Elburg on board, who proposed to accompany us to Tessnisak to procure some dogs and skins. We stopped at the island Kingituk on our way. We took twelve dogs on board, and arrived at Tessnisak early on the morning of the 22d. We staid there for two days, and left on the afternoon of the 24th.

From this time Mr. Bryan, Mr. Meyer, and myself kept a log. We had two patent logs overboard, one a-starboard, and one on the port side of the ship, and we noted all the distances and courses run. That is the original of our course from Disco up to the highest point north, up to 82° 16′, and our drift back to 81° 30′ to Thank God Harbor. These leaves which I have in my hand were taken by me out of the original

log-book and put together, in order that they might be in a more convenient shape to bring home in the boats, because we could not undertake to bring the whole large log with us.

These contain the original entries made at the time in the log-book of the courses and distances and other remarks made at the time. This log was kept by Mr. Bryan, Mr. Meyer, and myself. (The paper marked by the Secretary No. 2, E. B.) Besides that I have the different courses reduced and corrected. I lost one part, but I kept the other part. Here is the one part I saved, of the reduced courses and distances. This covers the portion from July 3, leaving New London and New York, up to the 26th of July. Here are more documents referring to the same thing, showing some of the courses of the Polaris. These are taken from the ship's log, because we only kept a log after leaving Tessnisak and at Smith's Sound. This little book (producing a little book resembling a bank-book, with leather cover) is our rough log. (The paper taken from Mr. Chester's log is marked by the Secretary No. 3 E. B. The rough log is marked No. 4 E. B.) We left Tessnisak on the afternoon of the 24th of August, and passed Cape York at 7.45 in the evening. There we met a little ice. On the 26th, at 4.30 p. m., we experienced for the first time a northerly set, indicated by the drift of ice moving rapidly to the south. At 7.30 we passed Cape Parry, bearing northeast by east, distance about twenty miles. At 8 o'clock we passed many bergs aground, abreast Cape Parry, imitating outline of the coast, seeming to indicate a shoal lying off the coast. The same range of bergs we also saw during our retreat in the boats in June, 1872. At 10 in the evening we found ourselves surrounded by broken ice. We had to steer very irregularly to avoid collisions, always keeping the land on the starboard side. Latitude at noon, by dead reckoning, 76° 12′; longitude, by dead reckoning, 69° 37′. By observation we made it 75° 56′; longitude, 69° 26′ 30″. At 1.8 o'clock in the afternoon we passed Conicle Rock, fifteen miles distant; at 2 o'clock, Cape Dudley Digges, about twelve miles distant; at 6 o'clock we saw a great number of walruses, and tried to kill some, but we did not succeed; at 8 in the evening we passed the mouth of Granville Bay, and an hour later we were compelled to take the logs in, being surrounded by broken ice. We put them overboard again at 9.30, but had to take them back 20 minutes after that. At 11.10 we passed Fitz Clarence Rock. At 4.30, on the 27th, we sighted Cape Isabella and Cape Alexander, at the entrance of Smith's Sound. At 5.15 we passed Hakluyt Island. Five minutes later we were stopped by ice. Latitude at noon observed 77° 51′, longitude at 3.51 p. m. 73° 5′. At 3 in the afternoon we entered Smith's Sound and passed Cape Alexander. At 4.37 we passed Port Foulke, at winter-quarters of Hayes, and at 5, Littleton Island; 6.50 we passed Cairn Point, and at 8 we found ourselves abreast of Rennselaer Harbor.

Now we began to shape our course to the west. What seems remarkable there is, that instead of finding the western shore blocked by ice, we really found there open water. We shaped our course to the west, not because we were met by ice, but because it was of the utmost consequence to follow the coast-line, and the east coast trended a good deal to the eastward, but we would not make as much north by following it. Consequently we took to the west course, and got along in a very short time. But what I want to say is that every current moving in the direction from north to south will be deflected to the westward on account of the rotation of the earth, and consequently it will deposit its ice, or any foreign matter that it carries, to the westward. In point of theory we would expect to find that, but in reality we found it to be different; and we found this to be

the case at every island or continent in the arctic regions. So, for instance, the west coast of Spitzbergen has been explored thoroughly. The east coast is hardly known on account of the ice. We find the same thing in Nova Zembla and on the east coast of Greenland. I do not know how to account for it. On our expedition we found in going over from the west coast open water where we might have expected ice to be deposited; we had the ice to the starboard side going out.

Question. How is it in Greenland, farther south? Is the ice on the east coast or west coast?

Answer. The ice is on the east coast of Greenland, and has accumulated there. The east coast of Greenland has been visited but very seldom.

Dr. Bessels, (resuming:)

We made over to the west coast on the 28th at 3.30 a. m., and found it clear of ice over there, at Cape Hawks, on the port beam, distant about fifteen miles. There we had to take our logs in. At 9 o'clock we passed Cape Wilkes; at 12.30 we reached Cape Shaw; at 2.30 Cape McClintock. Cape McClintock is a north cape of Scorseby Bay. At 3.45 we reached Cape Lawrence. We found that the east coast of Grinnell's Land is entirely different from what has been given by either Kane or Hayes. I have plotted all the different surveys from the year 1616 to 1865, made by Belot and Baffin in 1616, by John Ross in 1818, by Inglefield in 1852, by Kane in 1853, and by Hayes in 1865. I have reduced them all to the same scale, marking the different surveys by different colors, so that you can see the difference at a glance. (Plan produced.)

Dr. Bessels, (resuming:) At 12.20 we passed close to an island on the starboard side, passing between the island and the land. It had not been laid down by Hayes; but seems to lie in his very track. If his track has been put down right on his chart, he ought to have passed directly over that island. The island lies in latitude . We are still in Smith's Sound. At 2.20 on the 29th we had to stop to repair our engine. We took the logs in and started again at 3 o'clock. At 8.12 in the morning we had to stop on account of dense fog, and at 9.13 the reading of our log showed one hundred and nine miles. Observed latitude at noon, 81° 20′, longitude 64° 34′. As I have stated, we found ourselves at noon in latitude 81° 20′, having passed through Kennedy's Channel. At 4 in the afternoon we met some bergs and broken ice. We sighted Cape Constitution going up as we passed it, but it was not very clearly defined. It was rather hazy at the time, but we could see the land lying above it. At 6.08 we stopped, and started again at 7.18. At 9 o'clock we passed a mass of loosely packed drifting ice. We could see the land on both sides. We have always been able to see the land on both sides all the way up whenever it has been clear after we passed through Kennedy's Channel, the channel being at the widest part about thirty-three miles wide. The next day, the 30th, we found it very foggy, and we made our way through drifting ice, and had to take our log in at 6 in the morning, and put it over again at 9.13. At 9.35 we were compelled to stop, and we reached the third day our highest latitude with 82° 16′, the highest latitude ever reached by any ship. We were in a channel at that time, and some time before that some of the officers thought we were in the bay. When I came on deck in the morning, about 6 o'clock, Captain Buddington showed me a dark cloud, hanging quite low over the horizon, at a pretty good distance to the north, ahead of us. Sometimes, when the fog cleared away, you could get some glimpse of land, and this land is the northernmost land we saw. I placed it in latitude 84° 40′.

It is on none of the charts that have been published, but the land exists in reality. The land runs northeast and southwest. There is a high plateau with deep cliffs. I think we ought to name it Grant's Land. There is no doubt about the existence of land there. A few of us only have seen it, but Captain Hall, in his dispatch to the Secretary of the Navy, on page 15 of the previously printed report, says, "There is appearance of land farther north, and extending more easterly than what I have just noted, but a peculiar, dark, nebulous cloud, that constantly hangs over what seems to be land, prevents my making a full determination."

We made our highest latitude at 82° 16′ on 30th of August. In arriving at that latitude we had to construct our course back. It was rather difficult sometimes to do it, but then I think that it will be found to be quite reliable, because we were able to take the mean of two patent logs, and if we did not construct it back, if we took it from our set point of observation, were deducting the current, it really took us to 82° 29′, if we took it by dead reckoning, from that point. But in constructing it back and allowing for current, Mr. Meyer reduced it to 82° 16′. We had no deviation of the compass, and we had no proper observations for variation. So it was rather difficult. We had to take our variations from a chart made up by Mr. Schott for the expedition. I have brought back the original. (Original produced.)

After we reached the highest point we had to make fast to an ice-floe, not being able to penetrate any farther. We had a cousultation on deck among the officers of the ship, Mr. Chester, Mr. Morton, Captain Tyson, Captain Buddington, and myself. Messrs. Chester, Tyson, and Morton suggested going ahead. I did the same, only remarking at the same time that if we were not able to make any more northing we were to strike the west coast, because we had a fine base of land to proceed on. Captain Buddington said that he did not see any chance to go in farther, and so we did not attempt it. Captain Hall was very anxious to go north.

Question. Was there any opening to the north at that time?

Answer. I had not been at the mast-head. Tyson was there and one of the men, and they both reported that they saw plenty of open water, intersected by drifting ice. I was only on deck, and you know that from there your radius of sight is very limited. It amounted to about seven miles from the deck of the Polaris. We could not see open water from the deck. The ice was intersected by water-leads. We tied up to the ice and drifted back. Captain Hall had before that attempted to land at Repulse Harbor; that is a harbor situated on the north coast of Greenland, but finding the tide running very strong, he came back again. He attempted to put up winter-quarters there, but it did not seem to be very well adapted, being open to the north and subject to the prevailing winds, and consequently would be subject to the drift of very heavy ice.

On August 30 there was fog during the whole time. The rigging of the ship was coated with ice. You could see land on both sides, and could see it plainly. In the afternoon we had a heavy snow-fall, which was very likely produced by being in the vicinity of a heavy pack of ice. At 7.15 in the evening it cleared off, and Captain Hall, with Mr. Tyson, landed again at the same place—Repulse Harbor—but could not get in. It was filled with ice. At 11.30 in the evening we were compelled to make fast again. Ice was moving fast under the influence of the flood-current. August 31, 6 o'clock in the morning, we left the ice-floe; it grew foggy, and we had to tie up again at 7.50. On the 1st of Septem-

ber, at 9.25 in the morning, we tried to push on. We pushed to the eastward, but about thirty-five minutes after we had to tie up. During the night there was heavy ice made. Finally, we drifted down. We could not find any harbor along the whole coast, except, perhaps, at Newman's Bay, or in that inlet called on the chart Southern Fjiord. We had to make fast on the lee of an iceberg, called by Captain Hall Providence Berg, in Polaris Bay. He called that Thank God Harbor. We went into winter-quarters there. It consists of an iceberg. There is a slight indentation in the coast, but it is very slight. You would hardly see it on a map with an ordinary scale. The berg and some floe-ice formed us a sort of breakwater. We were swept down by the ice. I do not think that our drift was entirely due to the current. We had pretty strong northeasterly and northwesterly winds, and the mean strength of the current amounted on an average from 0.4 to 0,6 of a mile per hour.

On the 4th of September, midnight, we arrived at Thank God Harbor. During the next day we were employed in preparing for winter-quarters. The ship was unloaded, and the provisions landed on shore. We had an observatory set up on the shore at an elevation of 34 feet above mean sea-level. The Esquimaux were sent out to hunt and found traces of musk-oxen—animals found for the first time in West Greenland alive. Kane found several skeletons impregnated by carbonate of lime, but it is very likely that those animals had existed there a long time before. Musk-oxen have been discovered in East Greenland lately. The Esquimaux told us that on the east coast of Grinnell Land on the other side of the channel there are plenty of natives and more musk-oxen. They hunt them with the bow and arrow.

As already stated, we erected an observatory, and on the 18th Mr. Chester, the Esquimaux Joe, Hans, and myself were sent out on a sledge-journey to see whether there was a practical route northward, if during the spring the ice should not be in good condition to travel on. Besides that, we went to hunt musk-oxen. We came back again on the 24th, having found a plain about thirty miles long extending to the northward, and having killed one musk-ox. On the 10th of October Captain Hall, in company with Mr. Chester and the two Esquimaux, left his sledge-journey and went up to Newman's Bay, and returned on the 24th of October. After he came back he was taken sick. He started on the 10th of October and came back the 24th. I was at the observatory at the time he returned. I had fixed the observatory, and got the instrument ready to take our observations. Up to that time meteorological observations had been taken every three hours. From the end of October hourly series began. We noted hourly the height of the barometer, the temperature of the air, the moisture of the atmosphere, direction and force of the wind, and the amount and kind of clouds, with their respective directions, state of the weather, &c. Besides that, astronomical observations were kept up to determine reliable meridian.

As I say, I was at the observatory when I heard the sledges approaching, and went out to meet Captain Hall and his party. He shook hands with me, and I accompanied him about half-way to the ship; then I returned to the observatory. After some time Mr. Meyer came over to call me, stating that Captain Hall was taken sick, and was in bed. That was about an hour and a half after he had arrived. When I went out to meet him I had some conversation with him. He told me that he had had very low temperature and could not make any headway. He expected to go a great deal farther, but was compelled to return on account of the configuration of the land. The land he found to be mount-

ainous and barely covered with snow, and so he could not make any northing, and he was compelled to come back. He did not say anything at the time how he was, but afterward said he had not felt very well for two or three days.

As I said before, after I saw Captain Hall I went back to the observatory, and in about an hour and a half Mr. Meyer came over to call me, stating that Captain Hall was sick. I went over to see him. I found him in his bed. It was rather warm in the cabin, and the first thing I did was to open the door before I spoke to him. He told me he had been vomiting, and that he felt pain in his stomach and weakness in his legs. While I was speaking to him he all at once became comatose. I tried to raise him up, but it was of little use. His pulse was irregular—from 60 to 80. Sometimes it was full, and sometimes it was weak, and he remained in this comatose condition for twenty-five minutes without showing signs of any convulsions. While he was in this comatose state I applied a mustard poultice to his legs and breast. Besides that, I made cold-water applications to his head and put blisters on his neck. In about twenty-five minutes he recovered consciousness. I found that he was taken by hemiplegia. His left arm and left side were paralyzed, including the face and tongue, and each respiration produced a puffing of the left cheek.

The muscles of the tongue were affected also, (the hypoglossus nerve being paralyzed,) so that when the patient was requested to show his tongue and he did so, the point would be deflected toward the left side. I made him take purgatives. I gave him a cathartic consisting of castor-oil and three or four drops of croton-oil. This operated upon him three times, not to any great extent, however. He had not eaten much during the time he had been out. On sledge-journeys you have to try to save your provisions. He slept some hours during the night. Mr. Morton kept watch at his bed. On the morning of the 25th he took some arrowroot for breakfast, but he experienced some difficulty in swallowing it. He complained of the numbness of his tongue. Sometimes he was entirely incapable of speaking distinctly. Again I gave him a dose of castor-oil and-croton oil, and he recovered from his paralysis pretty well. On the 26th he had a restless night, and hardly any appetite in the morning. He asked for arrowroot, but when it was ready he would not take it. He ate some preserved food. I think he took some peaches and perhaps some pine-apple, but I am not quite sure as to that. He complained of chilliness, and indeed he had some very rapid changes of temperature—changes of temperature like you find in cases of intermittent fever. I tried the temperature by a thermometer. I applied it to him. The temperature sometimes rose to 111° and fell to 83°. I applied it in his arm-pit and sometimes in his mouth. He did not like to have it applied to the arm-pit. His temperature was higher in the evening. This was on the 26th.

Question. What was the state of his mind at that time?

Answer. The state of his mind was as well as ever before—quite clear at that time. Before that he had shown no symptoms of delirium whatever, nor was he delirious after that—at least I would not call it delirious. He regained his intellect entirely after he had been in this comatose condition. After having experienced these sudden changes of temperature, and he having recovered from his attack of apoplexy, I gave him a hypodermic injection of about a grain and a half of quinine to see what the effect would be. There was a decided intermission, as shown by the thermometer, and for that reason I injected a small

dose to see what effect it would have. He felt better in the evening. His temperature was normal. He took a little arrow-root and some soup. On the 27th his appetite improved, but he complained again of numbness in the tongue. He experienced difficulty in speaking. On the 28th he showed the first symptoms of a wandering mind. I saw him in the afternoon, and at 3 o'clock he jumped out of his bed, supposing that Captains Buddington and Tyson were after him with a gun to shoot him. I told him there was nothing of the kind, and sent for Captain Buddington and Captain Tyson. Captain Buddington came, and he seemed to be satisfied, but during the evening he grew worse and worse. He accused everybody. He thought that the cook was after him to shoot him, and gave one spring forward with a knife. He examined, if I am not mistaken, Captain Buddington's mouth, and said that he saw blue gas coming out of it, and thought they wanted to poison him. Mr. Chester wanted to give him a pair of stockings, but he would not take them for fear of being poisoned. He labored under such hallucination during the whole day. He was apparently well, but he did not take anything except canned food, and he opened these cans himself so as to be sure not to be poisoned. He was strong enough to do that. If he did not succeed in opening them he would have one of the natives assist him. He would call upon his Esquimaux, or Hannah, to do it for him; and during that time Hannah and Joe were the only persons that attended him. He did not trust anybody else. Morton was sometimes with him, and one of the men afterward, and he made them taste everything he took; even the food he took out of the cans. That state lasted until Saturday, the 4th of November. He would not allow me to go and see him from the 29th to the 4th. I did not have him under treatment during the whole time. He had some pills, and different medicines in a little box, and he took them. I do not know how many he took. He always wanted some pills. He asked me several times for pills, and to satisfy him I made him some pills of bread, and gave them to Hannah to give to him to take. He thought they did him some good at the time. On the 4th he grew more reasonable, but then there was a great difficulty in his speech. Sometimes he could hardly move his tongue. He complained of the heaviness of it, numbness, and sometimes in asking questions he could not give a decided answer, and hesitated considerably. That was both from his inability to articulate, as also from want of words. His paralysis on the left side was nearly gone, except so far as the organs of speech were affected. In requesting him to show his tongue he would do it, but from the time of the first attack the tip was always deflected toward the left. I bathed his feet with warm water and mustard on the 5th, and I tried to do it again on the 6th. He thought I was going to poison him with the bath, and I thought it was better not to excite him too much, and so I left him alone. At 1 o'clock on the morning of the 7th he jumped out of his bed, asking for Captain Buddington and Hannah. I was at the observatory at the time. Mr. Chester sent Mr. Meyer and Noah Hayes to call me. When I came he asked for some water, and, on examining him, I found that the pupil of his left eye was dilated and the right contracted. After having taken some water he went to bed. When I asked after the state of his health, he said that he felt rather worse than he did the day before; that he experienced more difficulty in speaking. He became comatose, and, at the same time, as soon as that happened, you could hear gurgling or râle in his throat; and, of course, under the circumstances, I could not attempt to bleed him.

By Surgeon-General BARNES:

Question. Did he become gradually comatose, or was there another sudden seizure like the first?

Answer. There was another sudden seizure like the first. His left side seemed to be paralyzed again. Previous to this, on the 2d day, he had regained his power of motion on the left side, and had apparently entirely recovered from his paralysis, except in the tongue. He now seemed to be paralyzed again on his left side. I found that out by trying him with a pin to see if there would be any muscular motion, but there was none. I tried the right side also. There was a sensation on the right side, but apparently none on the left. Finally we noticed reflectory or spasmodic motions of his muscles on the left side, resembling Saint Vitus's dance on one side of his body. Occasionally the same symptoms were noticed on the right side, but very seldom, and to a much less degree. This was on the 8th. At 3.25 in the morning he died. I did not attempt to bleed him after I heard the rattling in the trachea which I have described.

Question. Give us your opinion as to the cause of his first attack.

Answer. My idea of the cause of the first attack is that he had been exposed to very low temperature during the time that he was on the sledge-journey. He came back and entered a warm cabin without taking off his heavy fur clothing, and then took a cup of warm coffee, and anybody knows what the consequence of that would be. I did not look at the thermometer when I entered the cabin to see what the temperature was, but I found the room very warm; so oppressive that I opened the door before I went to his bed.

Question. What had been his physical condition before he went on the journey? Do you know anything about that?

Answer. Sometimes he used to complain of a headache, and of a numbness of his hand, or some part of his neck. He did that after we left, and I did not take it as a very good sign. Before he left on this journey I noticed nothing in particular. He appeared to be in his usual health. When I first came to him, after his first attack, I asked him how he had been during the last days of his sledge-journey, and he said that he had not felt quite well; that he felt a weakness in his legs, and sometimes suffered with a headache.

In the cabin in which he was when he was first taken sick there were eight berths. It had about 1,000 cubic feet, I should say. It was about 15 feet long and about 8 feet wide. Seven people slept there, including the captain. They all slept there during his sickness. The ship was housed in with canvas and banked up with snow, with a narrow passage-way at the gangway to come in. The change was very great, coming into such an atmosphere from where he had been on that journey for two weeks. He had been exposed to temperature as low as 20° and 25° below zero. His coming into this cabin, where the temperature was so different, produced a sudden reaction. The temperature of that cabin was from 65° to 70°.

Question. What medicine did you administer to him during the course of his sickness?

Answer. Some castor-oil and croton-oil, and some citrate of magnesia. During such intermittents I gave him an injection of sulphate of quinine. That is all the medicine I gave him. In fact you could not give any medicine in a case like that. I used mustard applications, and applications of cold water, and put a blister on the back of his neck. With regard to his appetite, he had to keep dieting all the time.

He wanted to eat seal-meat, &c., but I could not let him have it, and for that reason he accused me of wanting to starve him to death. At one time he got Hannah to cook him some seal-meat, and I could not prevent him from eating it after she had done so. I think he ate quite a lot of it on that occasion. That was Saturday, the 4th of November; it was the day he grew a little more reasonable.

Question. Do you remember his refusing to take medicine and Captain Buddington saying "Mix up rather more than he wants, and if he sees me take a little of it, he will take it?"

Answer. Yes, sir; he said so. He had not had a passage for two days, and I wanted him to take some medicine, and I could not get him to do it. So I mixed some castor-oil with croton-oil again, and gave it to Captain Buddington, and requested him to give it to Captain Hall to take, but Captain Hall would not do it. I could not get him to take it in any way. I gave it to Hannah, and he would not take it from her. He asked for some cathartic pills. I gave him some of those. When he was given some he buried them under his pillow. After his mind began to wander he grew very suspicious of everybody. He thought everybody was trying to poison and murder him. He never showed any direct suspicion or made accusations against any one before his mind began to wander. He did it the first time on the 28th of October. The first day the mustard applications were made I made them myself. Hannah brought the mustard to the cabin, and the steward brought the warm water, but I mixed them and applied them. Captain Buddington saw his tongue deflected, and Mr. Meyer saw it, and I think the Esquimaux Joe and Hannah also saw it. If I am not mistaken Chester and Morton saw it also. Morton was with him during the greater part of the time.

By Surgeon-General JOSEPH BEALE, U. S. N.:

Question. Did Captain Hall have any stertorous respiration, or did he breathe quietly?

Answer. He breathed quietly; there was no stertor at all.

Question. How did you know in the first instance that the first attack, that lasted 25 minutes, was not a case of syncope? You call it a comatose condition. How did you ascertain it was not a case of syncope? Might he not have fainted?

Answer. O, he was paralyzed.

Question. How did you know he was paralyzed? He was lying in his berth?

Answer. Yes, sir.

Question. How did you ascertain he was paralyzed? Was it a paralysis both of motion and sensation?

Answer. It was only paralysis of motion after the recovery. His paralysis did not leave him until the next day.

Question. Motion and sensation both?

Answer. Yes, sir.

Question. Did you try the sensation in the first attack?

Answer. Yes, sir; I tried it with a needle.

Question. How did you try the paralysis of motion?

Answer. I lifted his hand, and as soon as his hand was lifted it would fall.

Question. You had no doubt, then, that it was a case of that kind?

Answer. O, no, sir; there was not the least doubt about that. As soon as his hand would be lifted it would fall back again. He was not able to support it.

Question. You have mentioned that there was an interval of four days during which you did not attend him professionally.

Answer. No, sir.

Question. Did you see him during that time?

Answer. I saw him in the morning before I went to the observatory, and in the evening before I went to bed.

Question. Was there any medicine administered to him?

Answer. Nobody gave him any. He had some in his drawer. I examined it after his death. I found there some cathartic pills and some patent medicines. I found no narcotics, no opium.

After Captain Hall's death Captain Buddington and myself held a consultation, the result of which I suppose you have seen. I can produce the original. It was put down in black and white, communicated to the officers of the ship, and, if I am not mistaken, it was copied into the log. It was signed by both of us.

(A paper was handed Dr. Bessels, which he recognized as the original statement taken down in his own handwriting. It was marked by the Secretary, "No. 3, E. B.")

Dr. BESSELS, (resuming:) I am really at a loss as to what to say of what occurred during the winter. Observations were kept up diligently—meterological, astronomical, and magnetic. We had two snow-houses connected with the observatory, one of them containg a declinometer, and the other a dip-circle. The tidal observations began on the 6th of November, 1871, and continued until the 7th of June, 1872, comprising nearly eight lunations. These observations were kept up hourly, sometimes half-hourly, and to establish accurately the turn of the tides at intervals of every ten minutes, I compared the observations every evening, and had supplied the service with a good time-piece. These observations proved the important fact that the tide of Thank God Harbor is not produced by the Atlantic, but by the Pacific tidal wave. It was found that the cotidal hour is about $16^h\ 20^m$. Rensselaer Harbor, being the northernmost station, has its co-tidal hour at $18^h\ 04^m$, consequently the tide comes from the north, the rise and fall at spring-tides amounting to about five feet; at neap-tides, $2\frac{3}{10}$. Sometimes we had opportunity to determine the velocity of the current. Once we made fast to an iceberg, and by means of a log-line I measured the velocity of both the ebb and flood current, and I found the velocity of the flood-current to amount to more than that of the ebb; and sometimes the flood will continue to run while the water is falling. The iceberg was aground. The ship was made fast to it, and I hove a log-line and maul-line fastened to one end of the log-line. I threw it on a piece of ice, let it run out, and noted the time elapsed. I have about ninety-two measurements of velocity. Most likely the two tidal waves meet somewhere in Smith Sound, near Cape Frazier. Kane and Hayes have both found a ridge of hummocks near Cape Frazier, and in drifting down we experienced that during some time, being abreast of Cape Frazier; we hardly made any headway, but we drifted both north and south.

Rensselaer Harbor is the northernmost point known where the Atlantic tidal wave touches, and consequently both of those waves must meet somewhere. I suppose the tide we have at Thank God Harbor is the Pacific tide. We might call it the polar tide, because Behring Straits being very narrow, it is hardly possible that the tide can originate there. It was to the eastward of Spitzbergen, and between Spitzbergen and Nova Zembla, I noticed that two tides meet. I was there in 1869 with the German expedition. I wrote to the commander of the last Swedish expedition, at Spitzbergen, to send me some notes of

his tidal observations up there, they being the northernmost observations, except ours, that have ever been made. We have hardly datas enough to understand the tides until now, because there had not been observations enough in existence, but I think we are getting so now that we may be able to prove that the tide is really the Pacific tidal wave. During the winter we kept up the scientific observations. I have copies of those observations here. I have two books of tidal observation. (Dr. Bessels produces four books, two of tidal observations and two of meteorological observations.) These are original records of observations taken at the observatory, at Thank God Harbor, in latitude 81° 38′. I had, besides, some others, but lost them when the ship went adrift on the ice, as I shall hereafter detail.

After the appearance of the sun in 1872, I handed in a plan of operations to Captain Buddington.

Dr. Bessels being shown by the Secretary a paper marked "No. 5, B," he says: "This is the original paper, in my handwriting, which I handed in to Captain Buddington." Being shown by the Secretary paper marked "4, B," he says: "This is the letter which accompanied it."

Captain Buddington wrote me a letter to the effect that most likely the final expedition toward the north had to be made in boats. I have the original letter in Mr. Meyer's handwriting, signed by Captain Buddington, and his reply.

(Paper produced and marked by the Secretary, "No. 5, E. B.")

It being of the utmost importance now to connect Kane's farthest point with our survey, Mr. Bryan and myself started on the 27th of March for Cape Constitution. We had a sled with eight dogs, and Joe as driver. On the evening of the same day we arrived at the sound called on the chart prepared by Mr. Meyer the Southern Fjiord. We encamped on the island near the northern shore of it, and proceeded to the interior of the fiord on the morning of the next day, penetrating about twenty-eight miles, when our progress was checked by heavy icebergs that had accumulated. We could get no farther. We staid there to take some observations; fixed our position and made surveys in the vicinity. Besides that, we took a sounding in one of the tide-cracks, not getting any bottom at a depth of ninety fathoms. The next day we left and encamped again on the island.

When we undertook to start the next morning our sled broke down, and we had to send Mr. Bryan and Joe back to the vessel to have it fixed. I remained there until they returned, which they did in about thirty-six hours.

We succeeded in crossing the fjiord. We traveled along the western coast of Greenland, where we found at a distance of about thirty miles south from the fiord another deep inlet, which was explored. Said fiord is not marked on the chart made by Mr. Meyer. The track marked is not quite in accordance with the truth. We encamped again on a little island abreast of said inlet, and the next morning Mr. Bryan, Hans, and myself started to look for Cape Constitution, and supposing that we would find it in doubling the south cape of the islet. We found ourselves disappointed. In fact we could not see anything like Cape Constitution. So we had passed the latitude of the said cape, as indicated by Kane's map. I mean the second edition of Kane's map. There is a difference of about twenty or thirty miles in latitude between the first edition and the second. Kane took the mean between his dead reckoning and the actual astronomical observation; consequently his positions are so much farther to the north, because an arctic traveler is very apt to overrate the distance he has traveled. We traveled dur-

ing fifteen hours, finding the ice extremely rough. We had to abandon our sled, and climb over steep cliffs, there being no ice at some places, the water touching the rocks immediately. After some time we saw some smooth ice ahead, and thinking we were able to make some headway we turned back and carried the sleds and dogs over the cliffs. After having proceeded about ten miles farther we were arrested by open water. We could not reach Cape Constitution, nor could we see it plainly, but we noticed an island at a distance of about 25 miles to the southward. Morton, who had been with Kane when Cape Constitution was discovered, pointed to said cape and told me of such a place, where Kane and himself had been some years ago, and where they had killed two bears. We saw this cape plainly after we came down and identified it clearly as the same place—all of us, Hans, Morton, and myself.

Dr. Bessels produces sketches of Cape Constitution and the vicinity with the croquis of the rough survey. The papers designated, respectively, 1, 2, 3, 4, 5, were placed in an envelope and marked by the Secretary, "No. 6, E. B."

Those sketches were made on board the ship on our way home. I had some other sketches of Franklin Island and Cape Constitution, but they were lost—sketches that I took when I was out with Mr. Bryan, and Joe, and Hans.

We continued our travels until stopped by open water. We could not fix our lost position for astronomical observation, because it was cloudy and we had to make it up by dead reckoning. If we put Cape Constitution in 80° 25′ I think it will do justice to Kane. I think that is as high as it can be made. Perhaps you can make it thirty minutes higher, but not more. The land continues on to the northward above Cape Constitution to a considerable distance, instead of there being an open sea to the north of it.

We found an open sea there as Kane did; but open seas do not amount to much, because they are merely local, that is, the water is kept open by the influence of tides and winds. Sometimes the velocity of the wind amounted to sixty miles; there was a strong tide, and I do not think any ice could withstand that. Besides, the cliffs are nearly perpendicular, and no shore-ice can form there. Consequently the water has to remain open. There is no open Polar Sea there. Cape Constitution is on a narrow channel, and the land runs to the north of it for a considerable distance, instead of breaking off there, as is shown on the chart of Kane and Hayes. Cape Constitution is not higher than 80° 25′, and above that the land continues to the northward at least forty miles, before we come to the southern cape of the inlet, now called Southern Fjiord, making the eastern shore of a channel or sound, instead of an open Polar Sea, as was supposed by Kane from Morton's account.

On the 8th of April we returned on board the ship from the sledge journey. Several smaller expeditions went out for hunting and surveying purposes, until finally, on the 7th of June, we could make an effort to start with our boats. It was utterly impossible to proceed to the northward by means of sledges, the ice being too rough, there being too much snow, and the condition of the land not permitting of any travel—the configuration of the land. I find in Captain Tyson's statement that he thought it possible to travel overland, but the whole amount of atmospheric precipitation measured during our stay at Thank God Harbor was not more than $2\frac{1}{10}$ inches. I deduce from that that there was not snow enough. The greater part of the land was nearly bare of snow through the w.nter, and you woul dhave been compelled to draw your sledge over it. There was deep snow accumulated in

different places, but the greater part of the land was entirely bare of snow. At St. John's—341 hours, all told, during the time of our sojourn—there were .214 of snow there. The melting of all the snow that fell amounted to a little over 0.2 inches of water.

On the 7th of June Mr. Chester left with his boat to proceed to the north, but unexpectedly returned on the 9th. I did not go with him. Mr. Meyer and four of the men went with him. He stated that he had lost his boat in the drifting ice. The next day Captain Tyson, four of the men, and myself went with another boat, and we were fortunate enough to get by Cape Lupton, where the tide runs rather swift, reaching the middle of Newman's Bay on the evening of the same day. On the 14th, Chester joined us in the canvas boat with his whole crew, and I staid there until the 1st of July, without having been able to proceed any farther. The ice kept pouring down during the whole time through Robeson Channel. There was not water enough to float the boat, and the ice was not solid enough to travel over it. It consisted of small pieces during the first time and in hummocks, and only toward the end we had heavy fields coming down. In fact Robeson Channel was not frozen during the whole winter. It was always on the move, except during a few days in March. In the consultation between Captain Buddington and myself, you will see that we intended to start a party to Grinnell Land, but were prevented from doing so by the breaking up of the channel the day before I transmitted to him this paper. On the 1st of July, Captain Buddington sent a message by Hans, and said our presence on board the ship was required. I returned immediately with Hans, finding in making the south shore of Newman's Bay the first piece of drift-wood, and that is the only specimen preserved. It is just as I found it. I merely made a section of it, and polished it a little. Most likely it grew somewhere where there are extreme temperatures, very high temperatures during the summer and low temperatures during the winter. It is about twenty-seven years old. I cut it, and here is a piece belonging to it. After I had found it, I looked for about eight hours, and Hans did the same, but could not find another piece until we arrived at a plateau from about sixteen hundred to eighteen hundred feet high; and there we found this drift-wood, all consisting of small pieces, most likely Siberian pine; but it is difficult to identify it, although not impossible. It can be identified. The reason why I think the first piece I found is about twenty-seven years old is from the annual-growth points. It has twenty-seven, more or less, distinct rings, which can be seen and counted under the magnifying glass. I think all the pieces of wood are Siberian pine. I can hardly think any walnut has been found.

Question. Did you see the other pieces?

Answer. No pieces have been brought down except the few pieces I found.

Question. Those are the pieces Mr. Meyer refers to when he speaks of the wood as being walnut?

Answer. This looks a little like walnut, but it is no walnut. He states it smells a little like walnut, but I do not think walnut has any specific smell. These are the only pieces I saw.

In coming on board ship I learned from Captain Buddington that he had tried to push on to the north, but had been forced back by drifting ice; that he had attempted to take us off at Newman's Bay. He said that he had fired guns and made different signals to attract our attention, but we never heard them. Mr. Chester sent two of his men to get some provisions. He intended to spend some more time up there, but

finally he and Tyson were compelled to return because there was no prospect whatever of getting any farther north. If any other pieces of drift-wood were found in Polaris Bay I suppose they were found by seamen who saw them without knowing or appreciating their value, and did not bring them on board the vessel.

These pieces which I produce are the only pieces of drift-wood that I saw on board the ship. I have referred to the land to the north of the northernmost cape of Grinnell Land without any name. On the 7th of August two of our seamen, Robert Kruger and Henry Hobby, went back to Newman's Bay to get some of their clothing, and in going there they saw the land as plain as it possibly could be. One of them, Henry Hobby, remarked that the northernmost cape of Grinnell Land seemed to be so near to him that he used the expression that he could "spit on it," and he described the land to the north of the cape as perpendicular steep cliffs, covered at some places with snow; and the account of the land corresponds exactly with the bearings of the cloud that I had taken some weeks previous to that to the northeast of where he was. That is above the northernmost cape of Grinnell Land. This land lies above the northernmost point of that unnamed region which lies above Lady Franklin Bay, as laid down on the chart of Mr. Myer, and seems to be disconnected from it and lying off to the northeast and trending from northwest to the southeast. Now, Mr. Meyer, when he was at Repulse Harbor, stated that he could see a shining spot, and he took it to be open water. Now I do not deny that. I merely said that there must be some land behind such open water, and that in consequence of the open water he could not see the land. This is not uncommon. During our second winter-quarters at Polaris House we hardly ever had an opportunity of seeing the land which was opposite to us, though being only thirty miles distant. Sometimes we could see it. As an illustration of what I mean I will state that at our second winter-quarters at what we called Polaris House, at Lifeboat Cove, generally we could not see the land across toward Cape Isabella, on account of open water which lay between; but as soon as we had heavy southwest winds so that the water was blocked up with ice, and the frost-smoke from the water prevented from escaping, we could see the land plainly, and so I supposed this to be the reason why Meyer did not see this land which lies at the north. Two men saw the land quite plainly without glasses. Mr. Meyer had a glass. I can only account for it from the fact that there was, perhaps, an unusual amount of refraction at that time.

There is a great deal of refraction up there, and it is a refraction that is very unequal. We saw a great many mirages during the whole time. Sometimes the land seemed to be lifted up a great height, much higher than it was in reality, and we could see it actually at a great distance. We could see objects really situated below the horizon. This refraction was very frequent in these latitudes, and very unequal, as I have said. I should say this land which we saw was not farther south than 84° 40′, and is, of course, far the most northern land ever seen by human eye. I proposed to call it "Grant Land," as being the most northern land that we discovered, or that has ever been discovered, and shall so mark it on the chart to be prepared by me, knowing that it was Captain Hall's intention to name the highest land discovered after the President.

The water-cloud hanging over the open water in front of this land was seen by Mr. Meyer and also by Captain Hall, as he states in his dispatch, and was seen by us, when we were on our boat-journey for several weeks, daily. I took the bearings of it, and the land which was seen at intervals, by Buddington and myself in 1871, and afterward by the

two seamen, as I have mentioned, lies behind this cloud and could only be seen at intervals, being obscured by the frost-smoke from the open water in front of it.

Without concluding the examination of Dr. Bessels, the commission adjourned to meet to-morrow morning, at 11 o'clock.

WASHINGTON, D. C., *October* 17, 1873.

Examination of Dr. EMIL BESSELS resumed:

During the whole time of the boat expedition to Newman's Bay, the ice poured down from north to south with the exception of twice. On those occasions it went to the northward, except when it was at the time of the spring-tide, so that most likely it was under the influence of the tide. But the motion never lasted long. The first time it lasted half an hour, and the second time about fifteen minutes. It moved against the wind. The wind was from the northeast, with a velocity of about ten miles, and the ice moved to the northward against the wind. I came back on board the ship and found her leaking worse than before. The next morning another attempt was made to go to the northward in the ship, but we did not get very far. We did not even reach the latitude of Newman's Bay, and were compelled to go back; but, previous to that, we landed two men belonging to Mr. Chester's boat carrying some provisions. We came back to our old anchors, and during the whole time, until we started, we were troubled by some moving ice. We had to move nearly every day, and very often it happened that the ship grounded.

There was no possibility of stopping the leak. Captain Tyson states that there was rise and fall enough to do it, but in reality there was not. As I mentioned yesterday, the rise and fall did not amount to much, and, if I remember aright, gave it in figures. We could do very little during that time. We were not able, even, to get another set of pendulum observations, which were very desirable, because we had to be on the move during the whole time we lay there. Sometimes we moved three and four times a day, simply for the purpose of keeping clear of the ice. The different parties returned from the boat expedition; first Tyson and then Mr. Chester; and on the 12th of August we had to bear up for home, the ship being in a leaky condition. We had not coal enough to stay another winter, and to steam down the next year. It is my opinion that if the ship had not been leaking, and if we had had a whole ship, we could have staid there and continued our researches. After having passed Cape Constitution coming down, we got beset. In coming down we noticed Cape Constitution. We saw it distinctly. Those sketches that I handed to the Secretary yesterday were taken abreast of Cape Constitution during our voyage down. Both Morton and Hans recognized the place. Hans recognized it when he was with us during the spring, on the sledge-journey. He drew off an outline of the coast in the snow. I did not trust him at first, because I had left a chart in the snow-house where we encamped, and I thought that Hans might have seen such chart, but his answers to our questions were of such a positive character that we were disposed to believe him. He pointed out the spot where Mr. Morton and himself had killed two bears. I gave the latitude of Cape Constitution yesterday. We could not determine it by actual observation, but everything points to the fact that it is not any higher than 80° 25′. We had sight-lines twenty miles distant from the cape. We were distant about twenty miles to the north of it, and we took a right tangent to the extreme cape, supposed to be

Cape Constitution, from the point from where we stood—north 3° 15½′ east, and we took a right tangent to Franklin Island at the same time, north 3° 28′ east, and we took the left tangent to the same island, north 2° 18′ east. It was not possible to determine it by actual observation, because going down there we had no sun. We had only to fix our last position, and in making our way down with the ship we could not steer a steady course, so we were unable to fix it by true bearing or any other. We estimated the distance, and I marked the latitude of the cape on such sketches as I handed to the Secretary yesterday.

South of Cape Constitution, as we came down, we got beset, and drifted down along the west coast. That is the east coast of Grinnell Land and the west coast of the channel. During the greater part of the time we saw water along the coast, but we were never able to reach it until the catastrophe happened upon the 16th of October—until we broke out. We saw water along the west coast of the channel, but we could never get to it. We were beset in the middle of the channel about fifteen miles off the coast, and then we drifted in the same meridian south until we came to Force Bay. Then we followed the trend of the coast. The last point we sighted was Gale Point on the west coast, when a heavy southwest wind sprung up and there came on a heavy snow-drift. I will state that we saw Cape Alexander and drifted to the southward of that. At 6 o'clock on the 15th of October, in the evening, the ice separated at the stem and kept on separating until all the ice on the starboard side of the ship had gone. After some time the ice set in again. There was considerable pressure on the ship; sometimes she was strained and keeled over on her port side. Captain Buddington ordered the provisions and stores, whatever we had, to be thrown overboard. Nineteen persons went on the ice, partly to help to carry the provisions back to the house that had been erected some time ago in case of emergency. We staid on board of the ship handing and throwing the provisions over. It was about half past 11, if I remember aright, when the two hawsers parted, and we drifted at the rate of about ten knots before the wind and lost a floe with our men out of sight. Previous to that we could see that the floe had broken to pieces, and that one piece, with provisions, coal, and some records on, had gone one way, and the piece with the men in another direction. The third piece had on it two boats and some of the children asleep. Some of the men tried to launch the boat and made for the lost floe. That is the last we saw of them. It was all done in a very short time. It did not take over ten seconds. All the records of Captain Hall and of the astronomical and magnetic records were thrown over the side of the ship. There were several diaries. Part of my papers and the whole of Mr. Meyer's papers were put overboard. I could hardly tell who it was that put them overboard, it was done in such a hurry. I know they were put overboard, because I helped myself to take some of the boxes out of the cabin, and I saw a large Japan tin box belonging to Captain Hall, and containing his papers, which was put overboard. I do not remember exactly who did it, but it was done by either Mr. Bryan or Mauch. It was put on the ice, at all events.

Question. How does it happen that these records of yours were not put on the ice?

Answer. I had one drawer and a box of papers and specimens, and I carried those on the ice, and when I put them down a squall took some of them away, and I covered them and went back on board the ship and put the rest and those I have here in my blanket. I wanted to keep

them with me and then jump overboard with them at the last minute. I did not, however, get any chance to do it, so I have really saved them.

By the SECRETARY:

Question. But you know that the tin box in which Captain Hall's papers were was put over on the ice?

Answer. I am quite confident of that; also some magnetic, astronomical, and part of the meteorological observations; also the books regarding natural history, geology, &c.

Question. All of them?

Answer. Not all; only some of them. We saved the pendulum observations, but the observations of time are lost. We saved a part of the meteorological observations, the tidal observations, and some other notes. We saved some specimens, of which I have two boxes here. The specimens consist of one package of phanerogamic plants, one package of paleontological specimens, then a collection of insects, one bird, and some invertebræ and marine animals. That is about all. Besides that, we have Esquimaux relics found near Polaris Bay, and drift-wood. We saved tidal observations, as I stated, and they are most complete. Besides that, I left a duplicate of the tidal observations at Lifeboat Cove, with the log-books.

Question. You threw no specimens on the ice?

Answer. O, yes, sir; we threw our collections over. There was a box of nearly all the stones thrown over, all with the exception of two boxes. There was a barrel of bones, and another barrel of skins—all the rest of the dry skins and some bones. Those all went on the ice and were lost, except some skeletons. We had not put up any barrels of those, and so we have five or six musk-ox skeletons and a number of squirrels. We had a complete series of musk-ox skeletons. We had some sixteen skeletons, from the fœtus to the full-grown animal. Unfortunately we could not save any of those. We had a part of them on board the ship and took them on shore. We had no room in the house to stow them away, and the Esquimaux took the horns and used them. It would have been entirely impossible to have carried them with us in the boats.

On our return we were carried by the influence of the wind. The water was gaining fast on the ship. We tried to start our deck-pumps, but found them frozen in. Finally we succeeded in working them, but still the water would not diminish. It nearly threatened to extinguish the fire under the boiler. Finally, by smashing the doors and heaving blubber into the fire, we succeeded in raising steam enough to diminish the water, and some of us turned in, and after daylight we found ourselves somewhere near the coast. We took one of the sails down and cut it up to make bags and put our coal in, and at about 8 o'clock in the morning we began to work the ship in-shore, there being a lead just leading to the shores of Lifeboat Cove. In the morning we found ourselves abreast of Lifeboat Cove—just abreast of that lead. We worked the ship under canvas, and steamed as well as we could without the assistance of boats, and managed to get in, and used two tides to get up as high as possible. Then we landed our stores, and Mr. Chester, with the carpenter and some men, began to build a house for winter-quarters.

We kept a constant lookout on the mast-head for the men who were separated from us, but we never detected anything that looked like them; once Mr. Chester thought he saw a piece of ice with some barrels and bags on it, but opinions differed in regard to that point; and

even during the night we tried to make signals for the men. We had a lantern at our mast-head, and we put it up three times, but the wind blew so violently that it was extinguished with every attempt that was made to keep it lighted.

Question. How do you account for the fact that the men on the ice saw the ship so distinctly, and that they were never seen from the ship?

Answer. I really cannot account for that fact. It may be that they mistook an iceberg for our ship. That is often the case. Men often in that region mistake an iceberg for a sail. The fact is that we never were as near Northumberland Island as they state they saw us. At first, before we made the shore, we thought we perceived some men at Lifeboat Cove, on shore. But finally those objects we took to be men turned out to be bowlders. We kept a constant lookout for them. It is possible that they might have been in the shadow of some iceberg or the shadow of some hummocks.

Question. Could your vessel have been lifted up by the mirage so that they could see it when really it was out of sight?

Answer. It is not impossible that it might have been a case of mirage in the northern horizon, not in the southern. They might have seen us when we were not able to see them. It is also possible, as I have stated, that they might have been in the lee of some iceberg or hummock, or have been so near the shore so that we could not see them.

Question. How far north do you think you were blown on that occasion before you returned, after the hawsers parted?

Answer. About twenty-five miles, I think, we drifted that night. That is only an opinion. I would not like to state that positively.

Question. How far southward did you make again before you went into Lifeboat Cove?

Answer. We hardly made any. The only lee we could see was abreast of the ship, and we stood in for that lee.

Question. At the time these men saw you, then, you must have been nearly twenty-five miles off from them?

Answer. O, yes, sir; but perhaps not. It is possible that the ice-floe, being smaller than the ship, drifted faster. We moved about five miles that day.

Question. Was there any mist on the water at any time that might have prevented you from seeing whole objects in the southern horizon?

Answer. It was clear. The gale was over. The gale had abated about half an hour after midnight, and at that time we could see the moon. It was nearly full then; it gave considerable light, but we could not see anything. We could just see the dark outlines of the land; that is all. We could make out where we were. When we reached shore at Lifeboat Cove we landed as much of our provisions as possible, and Mr. Chester and some of the men set to work to build winter-quarters. The next morning some Esquimaux, with their dogs and sleds, came, stating that they smelt the smoke of the ship, and offered their services. They said they had not seen it. They made statements that they smelt it.

Question. Is their sense of smell very acute?

Answer. I should not think it was. They offered their services, as I stated, and we were very glad to accept them. These Esquimaux came from Eta, about twenty miles from the south from where the ship was. They said they smelt the smoke there. We had a light breeze from the

northeast, so they had exactly the wind that would enable them to smell the smoke if it were possible.

Question. Might not they have seen the vessel from Eta?

Answer. No, sir; they said they smelt the smoke, and that their dogs smelt it. As I have stated, the wind was blowing in the right direction for them to do so. We had a light breeze from the northeast. We did not take any observations; but I am certain the wind was from the northeast at the time. After the house was done and we were made as comfortable as possible, we set up an observatory on shore and took as many observations as our instruments and means would permit us. All the magnetic instruments had been lost. Some of the instruments had to be manufactured to take the place of those—some meteorological and astronomical instruments. The instruments that I saved all were lost on the ice. We lost, among other things, our declinometer, our dip-circle, and one box of chronometers—our standard chronometer. We lost one pocket-chronometer—Parkinson & Frodsham—and some barometers, and so forth; also a box belonging to the photographic apparatus exclusive of the camera.

During the winter we took such observations as our instrumental means would permit us. Astronomical and meteorological observations were made—the latter hourly. We saved mercurial barometers and aneroids, a number of thermometers, anemometers, psychrometers, and some other instruments. One of Regnault's actinometers was made to determine the temperature of space. We lived pretty comfortably in our house, only the ventilation was not very good except during heavy gales. We had a great number of them, and could hardly keep the house warm. Our bunks were lined with ice; the ice accumulated everywhere. We had nothing but a light canvas roof over the house, but, fortunately, it was improved by lining the inside with some old timbers of the ship. Our coal did not last us very long, so we had to take to the ship and burn her up as economically as possible with our fires. On various occasions we did not have any fire during the night, trying to economize fuel. Once we tried to see how it would do to cook in the house instead of the galley, to see if we could not in that way economize fuel, but we found that we consumed rather more fuel than if we cooked in the galley. The thermometer would indicate, about eight feet from the stove, some seventy degrees, while at the other end of the house a cup of water put on the floor would freeze; so we had to abandon that and take to our old galley again.

The lowest temperature during the winter was some time in March. It was about 44 degrees minus. The minimum temperature was from the 3d to the 4th of March, and that was 37°. We read our minimum thermometers at 8 o'clock in the morning.

Question. What effect did the lowest temperature have on the mercurial thermometer? Did the mercury harden?

Answer. The mercury seems to congeal at about 39.9. It is of great importance never to take thermometers with narrow bore. The thermometers with the wide bore that we had, and which were supplied by the Signal Corps, indicated correct temperatures down to 40, but those supplied by Cassella, in London, with narrow bore, would stop sometimes at 35.

By the SECRETARY:

Question. You made lower temperatures there than you made up in Polaris Bay?

Answer. Our mean temperature at Polaris Bay will be a little lower,

I think. Our minimum at Polaris Bay was 48, and it occurred in January, I believe, 1872.

Question. How did you obtain this—with what instruments?

Answer. We used the mercurial thermometer down to 40, or rather, as soon as the temperature came down as low as 35, we registered both the spirits thermometer and the mercurial thermometer. We registered both until the column of mercury was contracted down until we could not read it any longer. But all our instruments had been compared, at intervals of 10 degrees, from the highest temperatures we experienced down to the lowest, and those corrections had been applied, but still here in the books both instrumental readings have been given. I will now hand you some of the reductions of the different observations.

Question. Your mercury did not harden at 58 so that you could take it up like a shot, did it?

Answer. Our mercury grew hard, quite hard. At Polaris Bay we made some balls, and fired them through an inch plank. If the mercury is not quite pure it will not freeze at 399. Sometimes it occurred that it would remain fluid when the reliable thermometer showed 42, but then the mercury was never pure. Pure mercury seems to congeal at 39.9. That seems to be the point to adopt as a freezing-point of it; at least we did so for our corrections.

By the SECRETARY:

Question. What else did you do there?

Answer. We made all the observations we could make, and tried to get some dogs from the natives, and on the 13th of April we made another attempt to push on north to reach the provision depot at Polaris Bay. It was impossible to do it any sooner, because we had no skins, and had to send one of our Esquimaux—Esquimaux Jim—to the southern settlement to get some deer-skins to make some stockings, and some blankets to sleep on. It was on the 13th of April before we could start. We started with two Esquimaux, this Esquimaux Jim and another Esquimaux, Awatak. We started with those two Esquimaux who were willing to go. I pretended that I wanted to get some musk-ox, and was going to hunt for that purpose. They consented to go. I supplied one of them with a rifle. They were very anxious to go with me to hunt musk-oxen. A short time after we left, a light breeze sprung up, and they began to want to go back to the house, where they had had a comfortable time previous to that. After we had been out four or five hours, they didn't want to spend another night there. I did not agree with them on that point, and pushed on until we came to the hut at Anoatock. We put up in a snow-house that was about thirty miles from the ship. The next morning we started. The ice on the east side being very rough, the natives wanted to make me believe it was too rough to pass over. But I could see a smooth ice-foot along the shore. They persuaded me, however, to direct my course to the west coast. I did it, because it could not make any difference to me whether I made northing on the east or the west coast. Finally, however, I found that one of these natives did not intend to travel with me north, but wanted to go west and south in search of a bride. That did not agree exactly with my intentions, and he grew impudent. He was dissatisfied. He spoiled this man Jim, who seemed to be quite a reliable man. He requested me sometimes to give him something in my possession, and I consented to everything that I possibly could, hoping in that way to be able to go ahead. The highest latitude we reached by observa-

tion was 79° 16′.5. That was on the 16th of April, 1873. We ran about thirteen miles and met the east coast of Grinnell Land. There we met a ridge of hummocks. The natives refused to go farther. Jimmy declared that if I insisted on going any farther he would return on foot and go home to his wife. He told me that the dogs belonged to me, that we had given him his sled, but he would let me have it. He said I should drive the dogs and go alone wherever I had a mind to. I succeeded in satisfying them by giving one of them a hatchet and the other a saw, and stated that if they deserted me again I would take the hatchet and the saw away from them. They consented to cross the hummocks, the ridge of hummocks being about half a mile wide. We found three or four miles of level ice, and then we came to another ridge of hummocks. I could not get them any farther. They both wanted to go home, and I thought the best thing I could do was to go home also. In going home Esquimaux Awatak at once turned around on his sled and spoke to me. I could not understand what he meant. Finally he grabbed me by the shoulder and shook me. I did not like that kind of treatment exactly, and I took up my rifle and pointed it at him. The rifle was not loaded, but still he was very docile after that. We traveled for thirty-three hours until we reached the house. The greatest part of the time I was among the ice, making very good headway. I slept a few hours and then took another dog-team and went down to the settlement of Sorfalik to get another Esquimaux. I staid there during the night, and started the next morning with another Esquimaux and eight fine dogs and dog-food. I went up to the house at Lifeboat Cove and took my clothing and some little provisions on the sled, and Jimmy, my former companion, consented to accompany me again. We started. I had left a part of my dog-food and the heavier part of the outfit near Cape Inglefield, and so we shaped our course for that point. This time it was my intention to follow the coast-line of Greenland, though I was compelled to make a great deal of easting. I expected to find smooth ice when we reached Cape Inglefield. The other Esquimaux I got at Sorfalik gave way. He broke his sled on purpose to compel me to go back. I tried to mend it, but unhappily he had purposely left the saw behind that I had given him; so we had to return to the house. I left everything up there that I possibly could, dog-food and all, and we started with both sleds, one being badly broken. We repaired it, however. That was done at 5 o'clock in the evening. Then I wanted to start again, but I could not get those Esquimaux to do it. They would not go beyond Cape Inglefield the second time. They complained that the ice was rough, and that they had so much to do in lifting the sleds over the hummocks, &c., that they refused to go, and some of our party thought that they merely did it because I had pointed the rifle at Awatak. I do not know how that was. The fact is, however, they refused to go. I intended to try it again, but this time with one sled. I engaged one of our men to accompany me. Unfortunately, however, the ice broke adrift, and it was quite impossible to start, so we had to abandon the enterprise. I meant to go up the east coast of Greenland and reach the provisions at the depot at Polaris Bay. We had established a depot of provisions there. We left those things there before we started, because we did not know when we would lose the ship. We left pemmican, canned meat, bread and butter, shot, and such things as that at Polaris Bay. I promised those natives that we would get to a white man's house very soon, and then I would give them plenty of knives if they would go. I prom-

ised them a boat that we had left at Newman's Bay, but it was of no use. At one time they would consent, and then they would decline to go.

Polaris Bay is in latitude 81° 38′, but if I take those twelve miles into account I went to 79° 28′—about two degrees lower. If they had consented to go on, I think I might have reached Polaris Bay. If I had had Joe with me I could easily have done it, but you cannot govern those Esquimaux; they will have their own way. When Awatak told me that he wanted to wait near a seal-hole and watch the seal, I had to comply with his wishes, because I depended on him entirely. It was different with our Esquimaux. They were civilized and knew a little more about it. The natives did not seem to have any knowledge of the coast north. The natives of the American coast—of the west coast of Grinnell Land, and south of that—have a great knowledge of their country, and they can draw pretty accurate charts. Joe was quite a good draughtsman. We tried it several times with them. I gave them a piece of foolscap paper and they put down three huts at Etah, and put down our house and gave the configuration of the coast-line, and everything of that kind, but they could not give it any farther. The natives of the west coast stated that United States Sound, as laid down by Hayes, is in reality a sound connecting with Jones's Sound, and making Ellesmear Land an island. They call it Kickertack-Soak, which, being translated, means a large island. They at first said so to Captain Buddington, that there was such a sound and such an island. Jim's native name is Ttuckischu, and the name of his wife is Tvallu. They are natives of the west coast. They came up there from Cape Seal. They informed us that Grinnell Land is inhabited south of Cape Isabella, and that there are musk-oxen there, and a good deal of drift-wood, the drift-wood coming from the northward. Before I started I made a survey of the harbor, of the house, and vicinity. I have that survey here.

(The paper produced and marked by the Secretary "No. 7, E B.")

As early as possible Mr. Chester and the carpenter set to work to build the works, and were busy until the end of April and the greater part of May, the weather being rather unfavorable and giving them but little chance to work. They had a very heavy snow-fall during May, and the snow that fell during two days at Lifeboat Cove amounted to more than all the snow during the rest of the time from the second of November up to this time, the whole amount of snow there being 2.31 inches of water more than we got the whole time we were at Polaris Bay.

Mr. Bryan went to Rensselaer Harbor and to Port Foulke to connect the meridians of those places with the meridian of Polaris House, to make it more reliable.

I did not take all the records with me, because we did not know what might happen. Mr. Bryan has a part of the records with him; his diary, astronomical observations taken at Lifeboat Cove, and a view of about fifteen feet long, with all the details, of Grinnell Land. I had it among my papers. I made it going up, but I could not get to it when I left the Ravenscraig. Mr. Bryan, however, took it along and has it among his papers. It gives the details from Cape Frasier. I do not recollect as to the point, but a little farther than Cape McClintock.

Not having succeeded in getting north, I tried to travel inland to the glaciers, but unfortunately the Esquimaux are so superstitious that they fear the glaciers, and I could not get anybody to accompany me. They are afraid of the crevices. The glaciers are intersected by rather deep crevices if you reach a certain altitude, and some Esquimaux in the vicinity of Cape York—I think a man and wife with three children,

and a sled with dogs—went down at one time and were unable to recover themselves. That caused them to be extremely superstitious. They think that the glaciers are inhabited by evil spirits, and they declined positively to go. I tried to do it with Jimmy, and the last minute he backed out and told me that his wife could go along with me and drive the dogs. I said, however, that I did not like to take his wife along as dog-driver, so I took Jim. He promised me to go, but unfortunately he only accompanied me to the foot of the glacier in Eta Bay, called by Mr. Kane "My Brother John's Glacier." I staid there for four days and made some measurements of the rate of progress of the said glaciers, accompanied by psychrometrical observations, and tried to ascertain the limit of névé; that is, snow above the ice of the glaciers that has not been converted into ice. The glacier begins as snow, and is converted into ice by packing. We found that the limit of névé begins at elevation of 4,181 feet. I was unable to proceed any farther, because I was alone and the glacier was intersected by deep crevices, so I thought it would be best to return. The temperature proved to decrease 1°.13 F. for every 1,000 feet of elavation. The line of névé is not identical with the snow-line. We did not find the existence of the snow-line anywhere in Greenland.

After some days I returned, and went back to the house. Mr. Chester was still busily engaged in building the boats and arranging provisions for the two boats that had been put up in canvas bags. Finally, we started on the 1st of June to make our way from Melville Bay to the Danish settlement, the observations up at Polaris House being broken up on the last day of May. We started on the 3d of June again. We met with more or less difficulties in coming down, until finally the Ravenscraig picked us up south of Cape York, on the 23d of June. This chart (referring to an ordinary admiralty chart, with certain lines colored by himself) will give you the state of the fast ice as we found it in coming down, the green lines indicating our track until 75°, where the Ravenscraig picked us up. All hands on board the ship were extremely kind. They rendered as much assistance as possible, and took care of our baggage, and brought it on board the ship. Two days after that some of the men went out to take one of our boats on board. They arrived with it after having stove in one of the planks. We were ice-bound without being able to move until the night of the 4th of July, when we bore up and crossed the strait, and went to the westward, at Lancaster Sound. On the 7th of the same month we met the steamer Arctic. Our accommodations being rather poor on the Ravenscraig, Captain Allen was compelled to divide our party, and Mr. Chester, some of the men, and myself went on board the Arctic, Captain Buddington and the rest remaining on board the Ravenscraig. The Ravenscraig party was separated once more, Mr. Bryan and two of the men going on board the Intrepid, and we bore for home. We were unable to reach the Intrepid. We made signals for her, but either she could not understand them or could not get out of the ice. We had not coal enough to go over and take the men, and had to go home without them. We took the men off the Ravenscraig and proceeded to Dundee, leaving Mr. Bryan, Mr. Booth, and Mr. Mauch on board the Intrepid. We arrived at Peterhead, in the northern part of Scotland, north of Dundee, on the 18th of September, and our observations reach as far as Peterhead. The last observation was taken at midnight on the 17th.

Our observations have never been interrupted from the time we left Disco until we arrived at Dundee. We have not complete records of

them. The greater part of meteorological observations are entirely lost. We have some valuable observations to prove such a warm current following the west coast of Greenland is not the Gulf Stream, but likely the current produced by melting water trickling over the heated rocks. Sometimes we found even up there at Polaris Bay that the temperature of the water amounted to 54 degrees and more. We tried to use the dredge three times at Thank God Harbor, but the bottom being muddy we did not find any animal life as far as we could go out. And we could not use it frequently on account of the heavy drifting ice.

The whole original survey of Polaris Bay and of the whole coast of Grinnell Land is lost. Mr. Meyer made it.

By Commodore REYNOLDS:

Question. You have now no notes from which that survey can be completed?

Answer. We have no notes except the notes in the log, and some of those croquis with some positions scattered in the journals; but then we can make a pretty reliable map from such data as we have.

By the SECRETARY:

Question. Did you keep a journal?

Answer. Yes, sir; I kept a diary; I wrote it up every day. Unfortunately I used it up the last day at Dundee, in making up an elaborate report. I have such report in a little trunk with those soundings, and some of my private property, which went to London. I saw how it was put in the railroad-car at Dundee, and when we arrived at Liverpool the trunk was gone. I had five pieces, two boxes of specimens, a large trunk, and another valise. Everything was there except that little trunk. I wrote and telegraphed to the consul at Dundee to send it on the next steamer, giving him the address of the Secretary of the United States Navy, and asking him to have it forwarded to him. The railroad officials said it was not lost, and I would get it eventually. It was marked. It had my address on it at Liverpool. It contains three blank-books and a complete journal, written in English.

Question. Did you ever have any difficulty with Captain Hall, except those you have mentioned?

Answer. None whatever.

Question. What was the state of the discipline of ship during his lifetime?

Answer. I could not complain about the discipline; the discipline was good.

After Captain Hall died, Captain Buddington went into command. The discipline after he assumed command was not as strict as it ought to have been. I do not think it was as good as it was before Captain Hall died. I never heard any one, after Captain Hall's death, say that he was relieved by his death. I never heard either any expressions that had that meaning. I think once I heard some expressions before his death which were not very complimentary to him, but that was all. I do not remember who uttered those. Captain Buddington was in the habit of drinking at times. He did not refuse to drink when he could get it. I do not know that he was in the habit of getting drunk, but he was drunk twice, perhaps oftener. Twice I saw him drunk. The first time was during the winter, and, unfortunately, the second time was when we were on our way home with the ship. That was the night when we got off the west shore into the middle of the sound and got beset.

Question. Did you have any difficulty with him about liquor?

Answer. Yes, sir; a slight difficulty. I knew that he had been getting some of the alcohol. I thought it would be to the interest of the expedition to take it away from him. Nobody else would do it, and I was compelled to do it myself. I therefore watched him; I looked where he went, and he took the bottle—a bottle of alcohol; it was a half-pound bottle; it was strong alcohol. He got it out of the fore-peak, out of the scientific stores. The alcohol was kept for preserving specimens.

Question. As you were coming down you observed constantly the clear water in toward the west shore?

Answer. Yes, sir; there was clear water along the land. If we could have kept in there we would have been able to make our way down; at least I think so.

Question. State why you waited on the east shore rather than on the west.

Answer. Because the coast north of Lady Franklin's Bay was blocked by heavy ice and we could not get inshore. Once Captain Hall and Mr. Chester started across the floe. When we had made fast to it and made for the land, we found a lead, but unfortunately, however, they neglected to make the signals or neglected to provide for that. They came back and informed us, and when the lead had to be tried it was closed up again.

Question. If you could have made a harbor on the west side it would have been a great deal better?

Answer. Yes, sir; we could have made a sledge-journey along the shore. There was hardly any smooth ice in the vicinity of Polaris Bay. Mr. Bryan, two Esquimaux, and myself went over the whole of the smooth ice, and it did not extend any farther than from Cape Lupton down to the northernmost cape of the southern fjiord. It was all the area of smooth ice. All the rest was so hummocky that it would have been difficult to accomplish two or three miles a day. When Mr. Meyer went out during the spring, to take some angles for the survey, he was compelled to leave his sled behind and travel on foot, only to get out far enough to get sight-lines to some parts of the coast.

Question. Do you think it possible that some other season would have been more favorable for harboring on the west side?

Answer. I have not the least doubt. I do not think one season is exactly like the other. You will find that during one season you have a good deal of wind, or low temperatures, and the consequence of it is that the ice will freeze in hummocks.

Question. But you would probably be more helpless if you were cast adrift and wrecked on the west side than on the east, there not being so much assistance or so many Esquimaux settlements?

Answer. There are settlements south of Cape Isabella, and the natives inform us that those Esquimaux have boats with which they could actually cross the channel. They did actually cross with those boats some years ago, and Jimmy and his family have remained on the Greenland coast; the others went back.

By Commodore REYNOLDS:

Question. By that time you would be at Smith's Sound; but the question is, as I understand it, if you were at Grinnell Land, whether you would not find it more difficult to get away than if you were on the eastern side?

Answer. I do not think there is any point on Smith's Sound from where you could not reach the Danish settlement.

By Professor BAIRD:

Question. I mean still higher up—in latitude 81—away up as high as you can go on the west side. Would you do just as you did on this last occasion, go on the west side, or would you go on the east side?

Answer. As long as I had got ammunition to sustain life it would make no difference; there are plenty of musk-oxen there.

By the SECRETARY:

Question. Would not you find natives at as high latitudes on the west shore as on the east shore?

Answer. Certainly; that is just what I say. The natives on the west shore are, perhaps, a little more to the south; but, in fact, I do not suppose there is any danger if you are cast on shore at any point of Kennedy or Robeson Channel, if you have only dogs and sled and a gun.

Question. Was there any sickness on board except that of Captain Hall? Did you have to treat any one of the party?

Answer. We had a little scurvy among the crew, or a part of the crew, the first winter. The steward was taken sick with scurvy. It did not amount to much; he soon got over it. We had no trouble from any coughs or colds; in fact, nothing whatever. After we started for home Mr. Meyer had the scurvy a little, and during last winter some of our men had very light touches, but it never amounted to anything. We had not a sick-list during the cruise.

By the SECRETARY:

Question. Please give a description of your voyage in the Arctic.

Answer. After we were taken on board of the Arctic we crossed over in the Ravenscraig to the west side of Baffin's Bay. We went on board the Arctic near Cape Hay. We landed at Cape Hay to take some eggs on board from the resting-place, and, entering different inlets at Lancaster Sound, we took our way down Prince Regent's Inlet, landing at Fury Beach, examining the remains of the Fury that Parry lost at Fury Beach. Here we found scattered around some of the remains of the ship—a lot of the canned provisions in an almost perfect state of preservation. They consisted of preserved soups, meat, and vegetables.

Question. Why had not the Esquimaux got those?

Answer. Because there were none there. We tasted the provisions, and they were still very good. They were just as fresh as if they had been left there a short time since, and yet they had been there for more than fifty years. There was even some leaf-tobacco exposed to the air in barrels, and it had been wet several times. We took a few leaves along, dried and smoothed them, and they had not lost much of their flavor. Besides that, we found a cairn and thought it contained documents, and took it to pieces. But it proved to be a grave. I think most likely it was the grave of one of Ross's men.

Question. Had this place never been visited since Parry's time?

Answer. Yes, sir; when Ross had to abandon the Victory. He tried to get out of Lancaster Sound, but he had to come back. If I remember right he left one of his boats at Batty Bay, and had to put in there during the winter at Fury Beach. He built a house there.

Question. How do you know they were not his provisions?

Answer. Because he could not carry provisions along with him; and for another reason, that these provisions had the government mark on

them. They had the broad arrow of the British navy. The Ross expedition was a private expedition.

Question. Had anybody else been there besides Ross before you went there?

Answer. As much as I know, Parry had been there, and Ross. In addition to these we found two English muskets, with the mark of 1850 on them. It is possible that some of the expeditions in search of Sir John Franklin may have visited this place, though I cannot now recollect that they ever did; perhaps Kennedy. We were on a boat expedition to the south shore of Creswell Bay, and, strange to say, we found thirty or more deserted huts of Esquimaux, built with the skulls of the Greenland whale. We found some ninety-six skulls. Captain Markham, with whom I made this journey on board of the Arctic, found a piece of rib belonging to a walrus that had been cut with a dull instrument.

Question. Are the specimens you brought home of great importance?

Answer. Yes, sir. Among the specimens that I brought back are some very valuable ones that will prove, among other things, that Greenland has been connected with America, and that a rupture took place in the direction from north to south. We found that certain minerals of South Greenland have been deposited as far north as latitude 82°. We did not find any of the Silurian limestone which composes all the rock about Polaris Bay and the newly discovered land south of Cape Constitution, showing that the drift was formerly from south to north instead of from north to south, as it is in these latitudes. Besides that, we know that North Greenland has been rising, because we found drift-wood and marine shells at elevations of 1,700 feet and more above the sea-level, shells that are found alive now in the adjoining sea. Besides that, marine animals have been found in fresh-water lakes, at an elevation of 38 feet. The land at some places rises in terraces, each terrace indicating one period of an upheaval. This is the land at Polaris Bay. It has corresponding formations in Prince Regent's Inlet and vicinity.

By Professor BAIRD:

Question. The west coast of Norway is rising, is it not?

Answer. Yes, sir; to a certain latitude, and then it is sinking.

Question. What do you infer from the fact that the tides of Polaris Bay seem to be connected with the Pacific Ocean rather than the Atlantic?

Answer. As a general rule you find that the night-tides along Greenland are very much higher than those that occur during the day; and there is hardly any difference at Polaris Bay. Besides that, we find that along the west coast of Spitzbergen high water occurs earlier the higher we get north. Consequently the said coast must be under the influence of two different tides.

Question. Do you infer from this fact that there is an open-sea connection between Robeson Channel and the Pacific?

Answer. Certainly. I have no doubt you can make a northwest passage if the ice does not obstruct you.

By Commodore REYNOLDS:

Question. The high water where Dr. Kane was occurred later than with you.

Answer. Certainly. Kane had the Atlantic tide, and his tide came

from the south, while our tide came from the north. Kane's cotidal hour is later than ours. Our tide, as I say, came from the north, as proved by the establishment. We find by our observations that our tide came from the north, while Kane's tides, according to his account, came from the south. Ours came earlier than his, consequently ours could not have been the later effects of his tide, but must be an independent effect coming from the north. I therefore conclude at Polaris Bay the tides were the Pacific tides, not the Atlantic. The establishment at Polaris Bay, occurring earlier than at Rensselaer Harbor, proves that our tide must be a different one from that of Kane.

Examination of the witness being concluded, the commission adjourned until to-morrow morning at 11 o'clock.

WASHINGTON, *October* 18, 1873.

Examination of Dr. EMIL BESSELS resumed:

Question. Please take this book (Dr. Kane's Arctic Explorations, and the Second Grinnell Exploration) and examine the map in the fore part of it representing Kane's explorations, and state what corrections you are enabled to suggest as the result of your own observations.

Answer. In the first place, there exists another map—a second map—from the revised materials, in the Contributions of the Smithsonian Institution. That map has been constructed by means of observation and dead-reckoning, and in consequence of that we find that the most of the positions are too far north on this map. With regard to this map, beginning with Cape Constitution, we ought to place it, as I mentioned yesterday, in latitude 80° 25′ instead of 81°. Very likely the trend of Humboldt Glacier must be shifted a great deal toward the eastward. The northernmost point of the discoveries of Kane, on the east side of the channel, as laid down by astronomical observations, is Magarie's or Cache Island. The rest of the coast-line, in a certain direction, is correct, being based on a system of triangulation. In regard to the west coast, we have, in the first place, to mention that where Maury Bay, No. 25 on this map, is situated, a large sound ought to be shown as discovered by Dr. Hayes, and verified by the Esquimaux of Etau, who actually traveled through said sound. This sound proves Ellsmere Land to be an island. The sound itself is connected, very likely, with Jones's Sound.

Morton ascended an elevation of 500 feet, and it would be important to know how far he could actually see, because Mount Parry, put down as the northernmost peak seen by Morton, does not, in reality, exist, the land to the south of Lady Franklin Bay being of an entirely different character from that of the north. The former is mountainous, with a great number of peaks, like the coast of Spitzbergen, while the latter consists of a level, high plateau, with but a few hills. I tried to find the original survey of Kane, but I could not succeed. Parts of it are preserved at the Coast Survey, but other parts were at the Smithsonian Institution. Unfortunately, they were destroyed in the fire that took place at that building some years ago.

Besides that, the details of the west coast do not correspond to what in reality exists. The trend is also different, being more in an easterly and westerly direction. Instead of an open polar sea, as indicated by Kane, we found the land continuing, trending to the north and northeast up to latitude 81°, above Cape Constitution.

Question. Take Hayes's map and state what corrections you would suggest in regard to that. You have the chart of Hayes before you, as published by the Smithsonian Institution in January, 1865.

Answer. I have another chart, contained in the open polar sea narrative of Dr. I. I. Hayes, published in 1867. We find that there are discrepancies in these two charts. I refer to the plot produced the other day, and in looking at it we see that all Hayes seems to have done is to have shifted the coast-line, as laid down by Kane and Morton, a little to the westward, and making the different bays and inlets a little deeper. Comparing the chart in the narrative with that in the Smithsonian Institution, we find an island in the former in Carl Ritter Bay which is not laid down in the latter. Besides that, Lady Franklin Bay, on the former, terminates in a narrow inlet, abreast of which two islands are situated. The Smithsonian Institution map does not show the two islands nor the inlet alluded to.

In regard to the trend of Grinnell Land coast we noticed the same fact as stated when looking at the chart of Kane. The northernmost point reached by Hayes on his Arctic expedition is reached in 81° 31.5′, obtained by meridian altitude of the sun on the 17th of May, 1861. We all know that in such high latitudes the meridian altitude of the sun is not readily established, and perhaps the error of observation may sometimes be considerable.

In regard to the land north of Lady Franklin Bay I have to make the same statement I gave before; that is, that it is a high plateau and not mountains, as Hayes states it. Besides that, deep bays, like Peterman's Bay and Lincoln Bay, do not seem to exist—at least we were not able to perceive them from the Greenland coast right opposite. Cape Union could not be identified, and does not seem to project any above any of the other massive of the coast.

When we were at the farthest point the ship made, just a little southeast of Cape Union, we had the best possible chance that we could have to have seen it, but we could not see any deep indentation, and besides that we found the indentations much deeper on the chart in the narrative than they are in the Smithsonian chart. It seems to us that Lady Franklin Bay is a sound, on account of the setting in of the ice at a pretty brisk rate; and, standing on the summit of Cape Lupton, an elevation of 1,600 feet, we perceived a distinct separation of the north coast from something that seemed to be an island—a large island—in the middle of the bay. On Hayes's chart in the Smithsonian Institution it is marked Sylvia Mount, and on the narrative chart it is not marked at all. Mr. Meyer has given it on his chart as Mount Grinnell.

The little island on which we encamped on our sled at the northern point of the Southern Fjiord is in about the same latitude as Cape Constitution, as laid down on Kane's first chart.

Dr. Bessels here submitted a memorandum of the most important discoveries of the expedition, namely:

The results of the expedition may be summed up briefly as follows:

1. The Polaris reached 82° 16′ N., a higher latitude than has been attained by any other ship;

2. The navigability of Kennedy Channel has been proved beyond a doubt;

3. Upwards of 700 miles of coast-line have been discovered and surveyed;

4. The insularity of Greenland has been proven; and

5. Numerous observations have been made relating to astronomy, magnetism, force of gravity, ocean physics, meteorology, zoology, ethnology, botany, and geology, the records of which were kept in accordance with the instructions supplied by the National Academy, and some of the results of which we propose briefly to enumerate.

A.—Astronomy.

Great care was taken in determining a reliable meridian at Thank-God Harbor. Soon after entering winter-quarters an observatory was erected on the shore, thirty-four feet above mean sea level, and the transit instrument stationed there.

The longitude of this station was determined by the observation of—
300 lunar distances;
A number of moon culminations;
A great number of star transits;
A number of star occultations; and
A great number of altitudes of the sun on or near the prime vertical.
Its latitude, by the observation of—
A great number of circummeridian altitudes of the sun, and
A number of altitudes of stars.

All of these observations were lost, but a number of the results have been preserved which are sufficient to establish the position of this station.

The instruments used in the above observations were a Würdemann transit and Gambey sextants divided to 10″. The expedition carried six box chronometers made by Negus, three of which indicated sidereal time, and four pocket chronometers, by different English makers. These time-pieces were compared every day at precisely the same time, and the result entered in the chronometer-journal.

Besides the above-mentioned observations, 20 sets of pendulum experiments were made, which are saved, but the observations for time belonging to them are lost.

B.—Magnetism.

The magnetic observations obtained were more complete than any others ever before made in the arctic regions. The instruments supplied were:
One unifilar declinometer;
One dip circle, with Lloyd's needles;
One theodolite; and
Several prismatic compasses.

The observations on variation of declination were registered at Göttingen time, and were continued for five months. Readings taken hourly. Besides that, three term days were observed every month, according to the Göttingen regulations, one of these term days corresponding with the day accepted by all the magnetic stations. Further, a number of observations were taken either with the theodolite or the prismatic compass. Whenever possible, the dip was observed, and several sets of observations on relative and absolute intensity and of the moment of inertia were obtained.

C.—Ocean Physics.

Unfortunately there was not much opportunity for taking soundings. About 12 were obtained along the coast of Grinnell Land, which prove that the hundred-fathom line follows the coast at a distance of about 15 miles in Smith Sound. One of these soundings (90 fathoms) proved highly interesting, containing an organism of lower type than the *Bathybius* discovered by the English dredging expedition. It was named *Protobathybius robesonii*.

A number of deep-sea temperatures were taken with corresponding

observations on the density of the water. Following the coast of West Greenland the limits of the Gulf Stream were ascertained. Specimens of water from different depths were preserved in bottles, but, unfortunately, lost.

As soon as the vessel was fairly frozen in a tide-gauge was erected over a square hole cut in the ice-floe, and kept open continually; the pully and rope were supported by a tripod of oars. A rope to which a wooden scale, divided into feet and inches, was fastened, was carried through a block attached to the tripod. One end of the rope was anchored at the bottom by means of two thirty-two pound shot, and a counterpoise was attached to the other end to keep the rope properly stretched. This apparatus was tested by a series of scale readings with corresponding soundings, and proved to work very satisfactorily. The observations comprise eight lunations, the readings being taken hourly, half-hourly, and in some instances every ten minutes, in order to determine the precise moment of the turn of the tide.

D.—METEOROLOGY.

After having entered winter-quarters meteorological observations, which up to this time had been made three-hourly, were made every hour, Washington time. The register contained observations on the temperature of the air, atmospheric pressure, psychrometrical observation, direction and force of wind, appearance of the sky, state of weather, and both solar and terrestrial radiation. Besides, all extraordinary meteorological phenomena were carefully noted.

For the registration of the temperature of the air mercurial thermometers were used for temperatures down to —35 °F.; for lower ranges spirit instruments being compared at intervals of 10 degrees. As circumstances would permit, mercurial or aneroid barometers were used. As it was not supposed that psychrometrical observations could be favorably conducted at very low temperatures, the expedition was not supplied with the suitable instruments. For that reason two uncolored spirit thermometers were selected and used, the readings of which agreed. As check observations the dew-point was determined by means of Regnault's apparatus. To measure the velocity of the wind, Robinson's anemometer usually served. The distance traveled by the wind was noted hourly, at the same intervals of time. The velocity of the wind was determined either by the same instrument or by means of Casella's current-meter. These observations on the winds, combined with those on moisture of the atmosphere, will form a valuable contribution to physical geography.

It was not thought essential to procure photographs of the clouds, as they do not differ in their general character from those in more southerly latitudes. The only remarkable fact to be noticed is that sometimes cirri could be observed at very low altitudes among stratus clouds, which, however, is not surprising if their mode of formation is taken into account.

Special attention was devoted to the aurora borealis, which occurred frequently, but rarely showed brilliant colors, never bright enough to produce a spectrum. Whenever necessary one observer was stationed at the magnetometer and the other out doors, the former observing the motions of the magnet, while the other was watching the changes in the phenomenon and taking sketches. Although an electroscope and electrometer were set up, and the electrical condition of the atmosphere frequently tested. In no instance could the least amount of electricity be

detected. The amount of precipitation was measured as carefully as the violent gales would permit, by means of a rain-gauge supplied with a funnel. In February, as soon as the sun re-appeared, observations on solar radiation were commenced, and continued throughout the entire summer. The instruments employed were a common black-bulb thermometer, and one *in vacuo;* both exposed on white cotton.

E.—Zoology and Botany.

The collections of natural history are nearly entirely lost. With the exception of two small cases containg animals, minerals, and one package of plants, nothing could be rescued. The character of the fauna is North American, as indicated by the occurrence of the lemming and the musk-ox. Nine species of mammals were found, four of which are seals. The birds are represented by twenty-one species. The number of species of insects is about fifteen, viz: one beetle, four butterflies, six diptera, one bumble-bee, and several ichneumons, parasites in caterpillars. Further, two species of spiders and several mites were found. The animals of lower grade are not ready yet for examination.

The flora is richer than could be expected, as not less than seventeen phaneragamic plants were collected, besides three mosses, three lichens, and five fresh-water algæ.

F.—Geology.

Although the formation of the Upper Silurian limestone, which seems to constitute the whole west coast north of Humboldt Glacier, is very uniform, some highly interesting and important observations have been made. It was found that the land is rising, as indicated, for instance, by the occurrence of marine animals in a fresh-water lake more than 30 feet above the sea-level and far out of reach of the spring-tides. Wherever the locality was favorable the land is covered by drift, sometimes containing very characteristic lithological specimens, the identification of which with rocks in South Greenland was a very easily accomplished task. For instance, garnets of unusually large size were found in latitude 81° 30′, having marked mineralogical characteristics by which the identity with some garnets from Fiskenaes was established. Drawing a conclusion from such observations it became evident that the main line of the drift, indicating the direction of its motion, runs from south to north.

It would lead too far to enter into detail with regard to numerous miscellaneous observations that were made besides those mentioned above.

Examination of Emil Schuman.

I was born in Dresden, capital of Saxony. My profession is that of an engineer of bridge and road building, and laying out streets, &c. I am thirty years of age. I joined the Polaris expedition in Washington before it started. I joined it here as chief engineer of the steam-department. I went on the Polaris to New York, New London, and Greenland, and arrived at Disco and lay there until the Congress came. We took provisions in there, and also coal, and started for Upernavik. Nothing that I know of of any note happened at Disco. At Upernavik we took dogs, seal-skin, &c., and then started for the north. From Upernavik

we started up past Fitzclarence Rock. I made a drawing of that at the time. We found near Fitzclarence Rock great quantities of pack-ice. The water, however, got clear pretty soon again, and we worked through with steam. We used steam all the while, not having our sails up at all. We steamed up in the ice as high as 82° 16′. That is as high as it is made by the last correct observation. Captain Hall thought at first that we had been still farther up. He said we had reached as high as 82° 26′. When we got to that point we saw that there was no chance to get any farther; we therefore made fast to an ice floe and came back. I think it was the 1st of September when, an ice-floe coming against us, the vessel got a nip. Captain Hall thought we were in great danger, and ordered the provisions to be taken onto the ice. All hands were set to work at this duty. He told me to make a sketch of the position of the Polaris, and I did so. That sketch has been preserved. As soon as the danger passed away we brought the provisions on board again. We found that we had drifted down a good deal to the south by the current. Then we came out of the ice into open water again. That, I think, was in the night, from the 3d to the 4th of September. We steamed northeast and reached 81° 38′, where we went into winter-quarters. Captain Hall then gave an order to keep steam up all the time until we were frozen in, in case something should happen. Then the next day he thought he could find another harbor farther south, and told me to get steam up. We steamed south, but did not succeed. We then came back again to the same place. I think five days after that he told me not to fire up any more. Then I went to work and took the engine and everything apart, all the pipes, &c., so they would not freeze up. Expansion might have caused them to burst. The next thing that occurred was Captain Hall's going off on a sled journey. I really forget when it was that he started. I had everything written down and then lost the memorandum. I know that he was gone fourteen days. He had divine service every Sunday, and one day he told us that he was going musk-ox hunting. Dr. Bessels and Mr. Chester had been on such an excursion, and had brought one back, and he thought there must be plenty of musk-oxen in the country there, and so he gave it out that he was going musk-ox hunting for the purpose of bringing in fresh meat for the winter time. That is the only thing that I knew of. I knew of no other purpose. He then went on this musk-ox hunting excursion. He started with one sled, but afterward sent back for another. I think he took with him some fourteen dogs. Mr. Chester and the two Esquimaux, Joe and Hans, accompanied him. He was over fourteen days away, I am sure. He came back at the expiration of that time, bringing nothing with him. He said he could find nothing. When he came back I met him on the vessel just as he came on board, and I asked him how he felt. He said "pretty well." Then he went into his cabin and I went into my room. In the evening when I came into the cabin I found him sick in bed. I had at that time myself a very bad cough and remained on board of the ship most of the time. The next day I asked Dr. Bessels if he could give me something for my cough. He said that I should remain in the room. I went into the cabin where Captain Hall was, and I was there in the cabin with Captain Hall during the whole fourteen days he was sick; I only went out when I had occasion to. Being in there so much of the time I heard everything that was said, except when I was asleep, of course. In a short time he got delirious and remained so for the first three days. He really did not know what he was doing or saying. The fourth day his head was clearer, and I thought

he was getting better. He could speak and we thought he was all right. Then he laid down in his bed and jumped up and got crazy again. He would take his book and commence to write and then walk around in the cabin and suddenly change right off again. It was not three days after that before he was dead. He got very sick that night, and I believe on the 8th of November he died. On the evening of the 7th of November I heard him call the doctor and say to him, "Doctor, I am very much obliged to you for your kindness," and in the morning at 3 o'clock, I think it was, of the 8th, he was dead. He never said a word more than what I have just alluded to as having been said to the doctor that I ever heard after that. He laid perfectly quiet—could not move his left side three days before his death. I do not think that he had paralysis when he was first taken sick. I observed that he was better, and then I saw that he could not move the left arm at all, and when he walked in the cabin, after he got better, that was hanging down all the time. I do not think he had any difficulty in moving his left leg, but I always saw that arm hanging down. When he got into bed he would take hold himself of his left arm with his right and lift it up. I never noticed him in any kind of stupor. I have seen him sleep heavy, and he seemed, at times, to sleep very well. He would ask sometimes what that blue thing was coming out of the mouth of some person, and then he would call different people at times, and when they came he would call for some one else. Most of the time the doctor was in the room. He accused Mr. Chester of trying to shoot him. He would say to him, "I am not afraid of your powder." At one time he sprang out of bed and grabbed hold of him. Captain Tyson and Captain Buddington seized Captain Hall and put him into bed again. Whenever they heard a noise in the cabin they would come in to see what the trouble was. The cook was, at first, always by his side, but Captain Hall made him go away; he said he did not want him in the cabin with him any more. He thought he was going to kill him. I never heard him speak about poison in any connection; but everything he would eat he would first make us taste it. I never, however, as I say, heard him speak of poison.

I used to taste his food myself. He had a certain kind of beans that he sometimes ate. I do not know the name of them. I tried that, also. Everything that he ate somebody had, in the first place, to eat of. I never heard him say what was his reason. I am sure I never heard him speak about poison. When he thought he had offended any one he would, after a while, beg his pardon. He begged my pardon about ten times. He used to say to me, "Mr. Schuman, if I ever did wrong to you, I beg your pardon; I am extremely sorry." He said this to most every one. At one time he called Captain Buddington and told him in case he should die that he, Captain Buddington, should go to the north pole and not come back before he had reached it. Captain Buddington had to promise him that he would do so. That was about five or six days before his death. He was then a little better. That was the only time I heard him say anything about going to die. He said he would not live until the next day, but he lived about six days afterward. He did not say anything in my presence as to what he thought was the matter with him. He did not seem to notice his paralysis. He did not talk much about it. Hannah was sometimes in his room, and Joe and Hans sometimes came in. Dr. Bessels was with him most of the time. All those in the cabin, Mr. Meyer, the cook, the steward, and myself, were with him a greater part of the time. From the fact of my suffering with the cold I have spoken of, I was in the cabin myself nearly all the time and saw nearly everything that happened. I had a very severe

cold and not able at times to speak. I will state that Captain Hall was kindly taken care of by every one. The doctor was especially kind to him and did everything he could. The doctor, for instance, had a string on his arm and he made that fast to the arm of Captain Hall, so that, in case the captain wished anything, he had only to pull the string and that would notify the doctor. There were very few hours, indeed, that the doctor had sleep. The string was frequently pulled by Captain Hall. He seemed to want him all the time. He would not take medicine, however. I saw the doctor attempt to give him medicine, but he would not take it. Captain Buddington, Mr. Chester, and all of them begged him to take medicine in order that he might get better. He did take a little. He could not eat much. I did not see him eat things that the doctor did not want him to eat. He never took any great notice of the doctor in that respect. I did not see him himself open any canned meats to eat; I heard it stated that he did so, but I do not think he did. I used to open some canned meats for him, but he would not eat it; he gave it away again. He used to ask for everything. We used to indulge him by preparing such things for him as he expressed a wish for, knowing that he would not eat them when they were given to him.

I believed then, and believe now, that Captain Hall died a natural death. I saw my father die just in the same way that he did. I knew right off when Captain Hall was dying. I did not have then, and have not now, any suspicion as regards Captain Hall not having died a natural death. I do not think any person on board the vessel had. I never heard it intimated that he died from any other than a natural cause until I got to Dundee, and then I saw some such intimations in the papers. After he died we made a coffin and buried him. His journal and papers were all saved, I think. The captain took them in charge; he put them in a tin box, and read them, and we all read them. I did not read them myself, because I could not read Captain Hall's handwriting. I tried to do so, but could not. His journal was kept in a book like this, (referring to one of the books upon the table.) There was not much writing in the book. He commenced to write in it when we were in winter-quarters. He never did anything before that. Mr. Meyer kept his journal before that time.

Captain Buddington took command after Captain Hall's death, and Dr. Bessels took charge of the sledge-journeys and the scientific observations. The discipline of the ship was very good with both Captain Hall and Captain Buddington. It was just the same with Captain Buddington as it was with Captain Hall, only we had a little more liberty than we had when Captain Hall was in command. Captain Buddington told me that he had to give this liberty to the men in order to prevent the men from getting sick. He seemed to regard it as necessary that the men should have more or less freedom. He contended that that was the only way to keep sickness away from the men. The discipline, however, was well preserved all the while. I never heard one word out of the way. There was no disorder in the ship after Captain Hall's death, that I am aware of. There may have been forward in the forecastle, but I did not know of it. As regards Captain Buddington's habits of drinking I will say that Captain Buddington was tipsy sometimes, but I saw Captain Tyson drunk like the old mischief. I saw Captain Tyson when he could scarcely move along. We were in winter-quarters at the time. That was after Captain Hall's death. After a while there was nothing more to drink. I think there was only about one hundred bottles of whisky on board. There was no general drunkenness on board at all. Captain Buddington was drunk, I think,

once or twice. We remained in our winter-quarters until the 12th of August. During that winter I wrote a journal, but I lost it. I made the drawings, and during that time copied them off. I had put the machinery back again in the spring. When the temperature was warm enough to admit of it, I connected every one of the parts. There was some little repairing to be done. During the spring we found that the ship was in a leaky condition. I told the captain about it. I said to him that there must be a leak in the vessel. He said, "O, no; it is the water running off from the melting snow." I told him that I did not think that would make as much water as there was. We then commenced to examine the ship, and Captain Buddington found the leak outside. It was forward at the stem, 6 feet. The stem was broken. I do not know what could have been the cause of it, but I know that on the 21st of October, at the time we had a northeast gale, we broke out of winter-quarters and went adrift. As soon as we saw that we were adrift, and noticed that there was danger for us all, Captain Buddington ordered the second anchor out. We threw it out, and it got aground, and the vessel swung around onto the iceberg; there we made fast. One of the sailors went out and fastened a hook into the berg—we had fearful weather—that is all that saved us. The next day the weather got better, and we saw that we had all around us open water. The third day after that, when we were frozen in, we could walk on the ice again. Captain Buddington then ordered us to saw the vessel out from the iceberg. I think it was about two hundred yards. On the 27th there came up a southwest gale, and the gale hove the iceberg against the vessel. The tongue of the iceberg went underneath the vessel and struck the stem of the ship, and that wrenched it.

During the whole winter time the ship rested forward on that tongue, and aft she was afloat in the water, and then she was moved up and down by each tide. That broke the stem. We tried everything we could to stop the leak. We endeavored to calk up the place, and took off the iron plates and nailed them fast again. We could do this on the starboard side, but not on the port side. She was too much in the water there. I thought the leak was stopped until we got afloat again. As soon as we found ourselves in open water we discovered that the vessel was leaking. During the time when the party were to the north in those two boats—Mr. Chester and Mr. Tyson, with their different crews—we had to pump the vessel by steam. When they came back we pumped the vessel by hand with the large pump. We had made three different attempts to go north in August and before August, before we started for home, but we never succeeded in getting north. When we started for the south I pumped the vessel with the big engine because I had steam. When we made fast to the floes we got beset so that we could not go on. Then we waited for a chance to go on. I pumped only with the steam I had left. When that was all gone then we pumped by hand. I thought it, then, a very good thing for us that we had that little boiler that we intended to use for burning blubber. I took it and brought it more aft, and connected it with the feed-pump, so as to use the little boiler to pump the ship out. I succeeded in making such connection, and kept her just about clear. She was steady, going without stopping, for as many revolutions as she could make with the little pump.

One day we got a nip by a floe, and I found that she was leaking more. I could not pump any more with that little pump, and I set a hand-pump on again, and pumped with that. The sailors did the pumping and kept her clear until that night, when she broke adrift. I think

it was the 15th. Before that we had been building a house on the ice, so as to provide a shelter in the event of our having to leave the ship. We had all the provisions in readiness and had the coal in bags and ready to throw over when the time came. We did not throw off all the coal there. We had ten tons more in the ship.

I had all the while a temperature in the engine-room, which was above freezing-point all the time; but I was always able to get steam, and had a little boiler full of water constantly. When we found that we could not keep afloat by using the hand-pump, and I saw the water gaining, I reported to Captain Buddington the fact. I said she would not last more than three hours, and would then sink. I said "We cannot make steam then, if we cannot now." I saw the water gaining in five minutes about two inches, and the pump all the while going. As soon as Captain Buddington heard my statement he said, "Shove everything overboard." I made steam without any order. I saw it was the only chance to do so. I saw that, owing to the confusion, there was no probability of getting any order to that effect, and I took the responsibility upon myself. Before I had steam up, however, we were adrift. I came up and saw that the vessel had broken off, and saw some of the people on the ice. Perhaps in half an hour after that I had steam up, and the steam-pump gained an inch in an hour. I had to use the little steam-pump. We had no coal to do anything else with. We put six tons of coal on shore before we concluded to pump the water. There were ten altogether. If I had used the big pump, all the coal would have been used up in four hours. I never made a report that the water did not gain. That is what I have heard, but I never said such a thing. I was the only person who had an opportunity to know about this matter. The others were afraid to go below. The next morning we saw land; as soon as it was a little daylight, we saw land, and we looked for a chance to get on shore. We sent Mr. Chester up to the mast-head to see if he could discover anything of the other party. He reported he could not see anything. I had been up myself, but I could not see anything there. I had been up there only once. I could not leave my post at the engine a sufficient length of time to be going up there. I had a good look around while I was up there, however. The weather was clear. I had a glass with me and yet I saw nothing of them, nor of the house on the ice. I saw nothing but the water around. We steamed in-shore. The little boiler gave me about 600 or 700 revolutions as we worked steam up. Then I waited a little while until I got steam again to make those revolutions again, and so we worked ourselves through the ice and came on shore by high water. At low water we were aground. Then we went to examine the vessel, where she was and the condition she was in, and we found that the whole bow was gone. The six-foot piece was broken away entirely. The water-tight compartment, which the carpenter had built up in the winter, was the only thing that saved us. The ends of the plank were gone where the planks joined on to the stem. You could see into the bow of the ship. I made a sketch of it, but I cannot find it now; I do not know what has become of it. The ship's bow was open so wide underneath that you could see in and almost enter the boat through it. A man could have crawled in there, I am sure. She was beyond the reach of repairs that were within our means at that place. We might have repaired her in a dry-dock. I made up my mind that we would have to abandon the ship; that the vessel would have to stay there; that we would have to build boats. I did that as soon as I saw the condition that she was in. Then we went to work to build a house, and prepared to pass the winter

there. This was in the middle of October, I think, of last year. We all enjoyed the best of health during the winter. Nobody was sick at all. We had 10 boxes of meat, and had plenty of dried apples, sweet potatoes, Irish potatoes, and then we had fine seals brought on shore, and we had plenty of bread.

Captain Buddington during all this time that we were fast to the ice-floe, when we separated from it, and up to the time we ran ashore, did everything to preserve the Polaris from wreck. He could not do anything more. It was not possible. What he could do, he did. He was very anxious. He very often asked how it was, &c., &c., but you see I was mostly at the engine. I could not hear much that was going on on deck, but I know that he was a gentleman that did everything he could do as captain. I would cheerfully go with him again to the Arctic region if he were to go. My engine is all right yet I think. The only trouble is she is in the water. I had no trouble at all with her. The steam department worked well during the whole cruise up to the time she was beached. She was well fitted in the steam department.

In the spring we began to make boats. Mr. Chester and the carpenter built three boats. We gave one to the Esquimaux—the little one—and the others we kept. The boats were not coppered on the bottom, but they were very good—very well built.

On the 3d of June we started. We had a fair wind. We embarked in the two boats for the purpose of making our way to the South Greenland coast. We worked down about three hundred miles with fair weather. We never in fact had bad weather at sea. On shore we had several storms. When we saw a storm about to come up, we would put into shore and remain until it was over. Thus we continued until we were picked up by this steamer, below Cape York. It was very fortunate that we met with her at the time we did, as we had no fuel on the boats to make a fire to keep us warm. We had used the last piece just that day when we saw the Ravenscraig. We burned up all the coal at winter quarters. The coal was gone in January. That was all the coal we had on deck. We never used the Disco coal. It is there still. We had no chance to go down to get it. The coal we had then was from Washington. I saved the best coal until the last, and that coal was the coal we got from Washington. We saved enough wood from the vessel with which to make our boats. Then we commenced to take wood from the vessel for the purpose of fuel. When we left, all that could be seen of the Polaris was her deck. The rest was under water, and so she was the whole winter through.

I know of no difficulty at Disco or elsewhere. I did not see anything, and I know nothing except what I have heard others say. I really had nothing to do with any one else on the boat. I was kept pretty busy attending to my engine. It was only in the winter time that I went into the cabin. I used to go in there and remain there because I had no fire in my room, and therefore could not remain there, of course. My machinery would have been injured if I had not taken it all apart. I took the brass from the iron because it does not expand equally. I took everything apart and laid it one side. I think the excessive cold would have disabled the machinery if I had not done this. That will occur in the winter, almost everywhere, if care is not exercised. I think it was less likely to rust in that region than elsewhere, because the weather is drier. I did not of my own knowledge know of any difficulty that occurred between Captain Hall and anybody during the cruise. I am so constituted that I would not hear any if it were to take place. I would go away. As far as the crew are concerned, they were very obedient to

the officers. There were difficulties sometimes, but nothing serious. The only difficulty that occurred between the officers and men was because the men would not sometimes observe discipline; but Captain Buddington would generally bring everything into good order by a few kind words. I have never been on board of a vessel where there was so much harmony as on board of that vessel. I have now been at sea twelve years. I have always been an engineer; not on a Government vessel, however. In the first place, when I came from the polytechnic school, I got a position in Marseilles in a manufactory there, and from there I started off again to put an engine up in Africa, in Philipsville. Then I stopped in Africa three years and engaged in road-building, streets, &c. I worked at that three years, in different towns, such as they sent me. I built a market once. From Africa I started over to France again, and came home. I had the fever and ague at that time. As soon as I got well I came to America, and got a place in the North German line as assistant engineer. I worked myself up to the position of an engineer, and then I stopped in America. Then I took a place with Captain Hall. I was three years with the North German line. I gave up a good place to go on this expedition. I think the discipline on board the Polaris was not as good as that on board the North German line. We had a little more liberty on the Polaris than on the German line. Those liberties could be afforded, because we were free from temptations on shore such as are encountered on the North German line and other lines of steamers.

Examination of Henry Hobby.

I am a seaman. I was born in Germany. I have been to sea seventeen years. I have sailed in merchant-vessels as a sailor seven years; as first mate, two years; and as captain, I have been all over the world pretty much. I sailed as captain in the Mediterranean and North Seas, East Baltic, &c. They were small ships. I have been in merchantmen, but never in ship of war. I was first mate in an American bark that belonged at New York. She went to Callao. I was in no other American ship. That was in 1869 and 1870. I did not come back in the ship. She was condemned in Callao, and she had no cargo in her. I went ashore, and returned to Hamburg. I joined the Polaris at New York. Mr. Morrison engaged me as a seaman. Then I went in her from New York to New London, and from there to St. John; thence to Greenland, and thence to Disco. Nothing of importance occurred on the way. From Disco I went up north to Upernavik. There we got Hans and his family on board; and went from there to Tessiusak. We left Tessiusak on the 24th of August; we steamed north, always along pretty well through slack ice. On the 27th of August, we passed Hayes's winter-quarters at 3 o'clock in the afternoon; the next morning at 7 o'clock, Captain Hall landed on the west coast, off Cape Frazier, looking for winter-quarters, but could not find any. The ice opened again, and we steamed farther northward. In the evening we passed Cape Constitution, and we saw land on both sides off Cape Constitution, and after passing it. We were told, after passing Cape Constitution, that we would be in the open polar sea the next morning. Next morning, however, we continued to see land on both sides of us. The weather was not very clear; a little foggy; but we could see the land on both sides, notwithstanding. It is a very narrow channel. We steamed up

the next day for the north. The next morning, I believe it was the 28th of August, we got stopped in the ice. We turned back at 6 o'clock in the morning. We continued still to see land on both sides of us. On the 29th, Captain Hall called all the officers on the house, for the purpose of having them consult as to what it was best to do about establishing winter-quarters, or going farther north. I was on the lookout at that time on the crow's-nest. From what I heard, nearly all the officers wanted to go north. Captain Buddington and Captain Tyson said it was necessary to make winter-quarters as fast as possible. I could hear every word that was uttered. Captain Buddington wanted to go into Newman's Bay; Captain Hall and all the rest wanted to go north, with the exception of Captain Tyson. That is what I think. I heard no expression from Captain Hall; he merely asked every one where he wanted to go. I did not hear Captain Hall say himself what he wanted to do. When I was up there in this crow's-nest, and they were talking about it, I could see a way for going north on the eastern shore, from north to about northeast. So far as I could observe, I saw open water. There was land on both sides. There was no ice between us and the open water that I saw. I sung out from the crow's-nest, inquiring where they wanted to go. I told them there was plenty of open water to the northeast. I could not see exactly the point. Captain Buddington said that we must make winter-quarters. These were just the very words he said. I asked him where he wanted me to go, and he said, "Right over there, to Newman's Bay." The ship was lying still at this time, under steam, and not fast; she was just lying there. There was no ice to stop us from going north, as far as I could see. We steamed across towards the west side. We were about in the middle of the straits when we got beset in the ice. It was eight or ten hours after we commenced to steam west before we got into the pack. I was not in the crow's-nest all that time. Captain Hall called all the officers up there at 12 o'clock, or a little after 12. I came down by 2 o'clock. The ship was steaming among the ice when I came down, crossing the straits. We got, as I say, fast in the pack. The gale commenced from the northeast; we drove down with it, and when it came down Captain Hall or Mr. Chester crossed that floe where we were lying to see if he could not ascertain whether there was any passage over to the land. They went on the Greenland side. They went on foot. There was a floe of about five miles. When he came back Captain Hall ordered all provisions on board. In the morning, between 7 or 8 o'clock, we took everything on the vessel. We had put out a lot of provisions during the night. We put them out on the first of September, but took them back on the 2d or 3d. It was daylight all the time we were putting them out, but the sun was not shining. After we took the provisions on board, Captain Hall ordered steam to be gotten up. At 9 o'clock in the evening we opened a little bit of lead into the Greenland coast; that was about three or four miles from the coast. We had only the little boiler working. At 12 o'clock we dropped our anchor in Polaris Bay. The next day we laid there. In the afternoon we steamed down south looking for a better harbor than that was, but could not find any other place, and therefore made that for winter-quarters, up behind Providence Iceberg. At that time there was plenty of open water in the straits, and we were going to run out of it. It was calm weather, and no frost. We could see plenty of open water from the deck of the ship. Some of the officers wanted to go north, but some of them wanted to stop there. I heard them say so. Mr. Chester was one who wanted to go north. There was no one else that I heard say that. Captain Buddington said

it was the safest place to make the winter-quarters; that the season was too late to try any more to get north. I thought at that time that it would have been best to have steamed up to Newman's Bay to make winter-quarters there. We had seen that before. There was no ice coming down with the northerly wind in the straits. It was only twenty-two miles from Polaris Bay. I could not say whether we could have got any further than Newman's Bay or not. We made the ship secure there and commenced to sledge provisions on the shore. That is, we fastened two boats together and made a bridge over that, and took the provisions on to the shore, and built a house out of provision boxes. It was afterward broken down. I mean boxes that had provisions in them. We used the boxes for making the side-walls, and were going to put a sail over them, to have a house for exercising and amusing ourselves in. Mr. Chester and the carpenter were making a floor to it, &c. We intended to have everything nice and comfortable, but afterward it was left. Provisions were stored all in one pile. Captain Hall ordered the house taken down before he went away on the sledge-journey. He started away on the sledge-journey, I think, on the 14th October. He was away a fortnight, I know. Hans, Joe, and Mr. Chester accompanied him. They had two sledges. He came back a fortnight afterward, at half past 1 in the afternoon. We, all hands, were outside banking up the ship with snow. We made a snow-wall around it. I was attending to the tide observations at that moment. Captain Hall came to every one of us and shook hands, telling us how far he had been. He looked first-rate. A little while afterward, in about an hour, we were told that Captain Hall was sick. We heard it from the steward and from the captain. We were forward then on the ship. The steward told us that Captain Hall did not feel well. He said he had turned in, after he had drank a cup of coffee, and that Mr. Morton had undressed him; that he did not seem to feel quite well. Next Sunday, after Captain Hall had somewhat recovered from his sickness, the Esquimaux shot a big seal. Captain Hall was pretty well that day, and walking up and down the cabin. He seemed glad at the fact that a seal had been killed. I saw him myself at that time. I had not seen him before after his sickness. We were not allowed to come aft. I helped to carry the seal on board. It weighed five hundred pounds. We carried the seal-meat aft of the wheel-house, for the purpose of having it there if any of the men got sick with the scurvy during the winter. He seemed to be rejoiced to think that he had it. He did not so express himself to me, but I heard him say to Hans that he was so glad that he had got a seal. I could see him through the windows, and I saw him laughing and rejoicing over the fact. Three days after that he was dead. I did not see him after he was taken sick until this once, when I saw him through the windows, when I was carrying the seal aft.

Joe Mauch, captain's clerk, came into the cabin in the morning and told us and told the chief engineer and myself, that there had been some poisoning around there. I asked Mauch about it, and he told me that there was "llousaure." I do not know what it is in English. He did not say any more about it. I do not know what it was used for, whether it was good or bad. He did not mean to say that Captain Hall had taken this, but that the smell was in the cabin—used there for some purpose or other. Captain Hall died at half past 3 in the morning. Some of us were called out. I was awake and was told that Captain Hall was dead; Captain Buddington told me. I came up on the deck; he stood just on the fire-room scuttle, and said, "We are all right now." I said, "How do you mean by that." He says, "You

shan't be starved to death now, I can tell you that." I says, "I never believed I would." That is what I told him. I had not been starved before. We had been pretty well hungered, however. Half of us only got enough to eat. This was without Captain Hall knowing it, for Captain Buddington told us here in Washington, at the navy yard, that in regard to all matters of eating we had to come to him, and not go to Captain Hall at all. We never went to Captain Hall at all. We always told Captain Buddington that we had but half enough to eat. On one occasion two of the men were sitting down in the lower cabin, Captain Hall was in the upper cabin. He was making a tent that he intended to use on his journey north—a canvas tent. Mr. Chester says to me, "Well, boys, it is dinner time, and you can go and have your dinner." We said, "All right, but it is not much to us; by the time we come to eat after 12 o'clock, it will all be gone any way." Captain Hall heard the remark from where he was in the upper cabin. This was before Captain Hall started on his sledge journey. The next morning and every morning Captain Hall was alive, at half past 8 o'clock in the morning, we had to be up, washed, and dressed, and clean, and in the upper cabin for prayer. Everybody had to be there. Just at the close of the next meeting, after he had heard the remark I have referred to, he told us that he had taken the expedition from the American Government, and we all must eat and drink alike. That we were servants to him, that everything he had to eat and drink we would have just the same. Captain Hall said that he did not know that we were not fed sufficiently. This conversation was in the upper cabin in the morning at prayer-meeting, in Polaris Bay, before he left on the sledge journey. All hands were present when he said this—officers and men. John Heron, the steward, served out the provisions. We did not have enough to eat after we left Disco; there was some shortening before we got there. There was some kind of quarreling, that is, we had heard that there was some kind of mutiny on board; when in fact there was no such thing. We heard that Captain Buddington, Dr. Bessels, and Mr. Schuman, and all of them were going to leave, and there was some talk among the men about leaving also. This was at Disco. What we said was, that we did not have exactly enough to eat, but then it did not amount to anything at that time. We never spoke to any of the officers, saying we were going to leave. I did not intend to leave, but some of the men said that they were going to leave; they were afraid that Captain Buddington, Dr. Bessels, and the others would leave the vessel, and that we would have all the regular naval officers come aboard from the Congress, and that they did not seem to like.

From St. Johns to Disco we had plenty to eat, then there was a change of rations at Disco and afterward. It commenced as soon as we got into the ports of Greenland, Fiscanaes, Holsteinsberg, &c. It changed slowly. The rations changed in every respect. At dinner time, if we did not look out and get there in time, there were three or four who would get there and take everything on the table and the rest would get scarcely anything. That was not in Disco, but that was afterward. In Disco it commenced to shorten down all the while. It was not because we were able to eat so much more when we got up into the northern latitude; there was not as much served out to us when we got up there. We spoke about it to Captain Buddington and he said he would look after it. We never got the thing made better until Captain Hall found it out himself. I do not know why the allowance was shortened. Captain Buddington told us at the Washington navy yard that we

would have plenty to eat. After Captain Hall found it out we then had abundance—as much as we wanted. The cook generally spoiled the grub, however. I was forecastle steward. Captain Hall allowed one man to look after the forecastle for the purpose of keeping everything clean with a view to health and so on. While in the performance of such duty I heard Captain Hall saying to the cook myself, that if you are not down attending to your business you shall not have a cent of pay when you get home. He said that on the galley while I was standing alongside of the galley door. The cook was a mulatto man. The ship was then in Polaris Bay; I could not say whether it was exactly a couple of days before the prayer-meeting to which I have referred, at which Captain Hall made the remarks relative to our being better supplied or not. The cook I know never did any better. He spoiled more grub than there was on board the Polaris, and if there had been any more he would have spoiled more. He never cooked a proper meal. There was plenty of everything. The bread, however, was half baked; so was the musk-ox meat. His bread not being in a condition to be at all eatable he would throw the dough over the side.

We were always pretty short at sea from Disco on to Polaris Bay. We could eat pretty well what he gave us. We had meat, potatoes; but the potatoes were not at all boiled. We had only one barrel of salt beef with us on board. Captain Buddington came out after Captain Hall's death and said we would have plenty to eat after this. Nothing further took place then. I went away into the forecastle. I did not know what he meant. I went down in the forecastle and cleaned it up, when one of our men was helping the carpenter to make a coffin. Two days after that Captain Hall was buried. I think it was on the 10th of November. After he was buried, everything went along as Captain Hall ordered it, in every respect, only the prayer-meetings in the morning; they were discontinued shortly afterward. Captain Buddington discontinued them. All hands, officers and men, were at prayer-meeting one morning, and he told us, when we got through, that the prayer-meetings would not be continued any longer, and that every man might do his own praying there. Mr. Bryan conducted the prayer-meetings for some time after Captain Hall's death. We had prayer-meetings on Sunday from 11 to 12 o'clock. Everybody had to be there while Captain Hall was living, but about a month or six weeks after his death they were discontinued. There was only Herman Siemons, Captain Buddington, Mr. Morton, Hannah, and myself in the prayer-meeting one Sunday morning, and Captain Buddington said there was no use of carrying this on any further; nobody wants to come any more, and we had better knock it off altogether. Mr. Bryan was there; I forgot to mention him. He conducted the meetings. Mr. Bryan said nothing, that I know of. That was about the only change that occurred after Captain Hall's death. Everything was kept up as Captain Hall had ordered it. I heard Captain Buddington say that he could not force a man to go to prayer-meeting against his will, and that he would rather take a tramp around—take a walk. Some of the men liked the discontinuance of them, and some of them did not. During the winter season the men used to amuse themselves by taking sleigh-rides. Captain Buddington gave us all the privilege of going off on our own hook at times, and allowed us the use of his harness and his dogs to ride out with as often as we pleased. We frequently went north nine or ten miles from the ship along on the coast close to the ice. No officer accompanied us, and no Esquimaux. We could drive the dogs ourselves. We saw plenty of open water during the winter. The whole of the straits were open there; the ship

was frozen in, however, so that it could not get out into open water. There was a bright, clear moonlight; it was sufficiently light for us to see. From Cape Lupton to the ship was clear, open water. There was a little bit of a bight in the land that was ice; we drove along that. Then one day the doctor, Robert Kruger, and myself were out there, and Herman Siemons was attending to the tidal observations. The doctor told us that the flood stream came from the northward. At half past 1 the tide altered, and the ebb-tide then came from the northward. Afterwards I heard that he contradicted that. I saw it every day. I heard some of them say it was not so, but I know that it is. I was observing the tides; I observed the tides for three months. There was a regular ebb and flow six hours each way, with six feet rise and fall. The ice would flood to the northward with one tide when there was no wind. The tide would take a regular change one way or another. When there was a gale coming, by and by the icebergs in the middle of the straits would not take such a fast move to the northward. That is the reason some of them said there was a general current from the northward down south, but it was not so. I am sure the current was the other way, from south to north, and quite regular. In the spring of the year the melting snow from the ravines and the land drives the water down, and it may run more one way—more to the southward than it does to the northward. In the spring of the year the wind is always from the northward, but not in winter when there is regular weather. The ice out in the middle of the channel would go to the northward just as well as to the southward. It would have its regular hours for the turn. The current was that of the tide. The ebb-stream is not strong as the flood-stream. I never watched if there was a constant set in the middle of the channel, that is, while in Polaris Bay. I heard the doctor say there was an ebb-current in Polaris Bay, a little ways outside of Providence Iceberg. Providence Iceberg lies about two hundred and fifty yards from the beach; about one hundred yards outside of that we could see the regular tide north and south as far as we could see anything. I always took the berg farthest out into the stream and took a land-mark on the west coast over to Lady Franklin Bay, and watched closely whether it was so or not, and by that land-mark I observed this ice in the middle of the channel set both north and south when it was regular weather and the wind did not interfere.

In the spring of the year we went inland sometimes for eight or ten miles, and went hunting, but we could not see any living thing except the tracks of the leming. We could see these everywhere, but not the lemings themselves. There were any number of tracks there. In the latter part of March I shot the first rabbit. Then the same day we shot some partridges, about nine or ten, I believe. When we had nothing else to do we amused ourselves just as we liked. Finally Mr. Chester ordered the two boats to be made ready to go north.

We had two small whale-boats on the shore, and we took them alongside of the ship, and the carpenter and Mr. Chester commenced to fit those up, put lockers around them, &c., and had them made serviceable. They were intended to travel the straits with, as soon as they were opened; but really the straits were not frozen up at that time—not in March. Mr. Chester's intention was to go with the boats to the northward. Captain Hall had said, when he came back from his sledge-journey, in the fall, from Cape Brevoort, that there was not much use in sleighing on the Greenland coast, as the land lay too much to the eastern side. He said that we would have to go across the straits, and go over to the other coast. When the boats were completed and everything in

readiness Mr. Chester and his party and Captain Tyson and his party started. I accompanied Captain Tyson. We were gone about a month. Captain Tyson said that we went thirty miles. Mr. Chester afterward determined that it was only twenty-five miles. Captain Tyson, I think, was not able to take observations; he couldn't correct his instruments. We came into Newman's Bay eight days before Mr. Chester. He lost his first boat, and it took him eight days to construct another and get to where we were. In the evening, a week after that, when Mr. Chester, Mr. Meyer, and he came, at 7½ o'clock, Mr. Meyer asked Captain Tyson what latitude we were in, and he said 82° 02′. The next morning Mr. Meyer and Mr. Chester took observations, and said that Captain Tyson had made a mistake. He said, "No, O no; you had better look at your books," &c. They made it out finally about 81° 55′ 45″.

Then Captain Tyson said that as Mr. Bryan had made his instrument all right, it was in a condition to take observations right away; there was no indexing to be brought on at all, or anything else like that. We did not go any farther. If we had had another captain in our boat, we could have gone across to Cape Union. The whole of the straits were open; there was not a single piece of ice in the way. Mr. Chester did not go over, because he had only a canvas scow; he had lost his first boat. As I said, there was not a single piece of ice to prevent us moving farther at this time. Mr. Chester thought that Captain Tyson would get across with his boat to Cape Union sure. He said he would have gone if he had a boat like ours. We did not go any farther, however. We laid there a month waiting, and then Mr. Chester sent two of his men to the ship. We laid within a mile's distance of each other; Mr. Chester was a mile farther to the northward. We did not want to go back to the ship, and so Mr. Chester sent two of his men back to get more provisions, so that we might wait until later in the season for a better chance for traveling. Mr Chester thought that we could do something a little later. Captain Tyson said it was too late at that time to do anything. When the two men got to the ship, Captain Buddington kept them on board. He said that his ship was leaking. He tried to get up to us with the ship, we being only twenty-five miles off, or twenty-two. He tried two or three times, but did not succeed. I did not see the ship, but that is what these men whom Mr. Chester sent told us afterward, when they came with the provisions. We heard the sound of a gun. He had a double charge in the gun. We could not see the ship from where we were, but we heard the sound of the gun in the evening. Then he told us that the ship was in a very bad condition, and he had been using the big pumps to save coal. He pumped with steam before we left with the boats. Then we went back and left our boats. The captain sent Hans with a note, requesting us to come on board. I could not see what was in the note. I do not want to say what I did not know. However, there was a note addressed to Mr. Chester, and none to Captain Tyson. Mr. Chester told Captain Tyson that the captain wanted us to come aboard, and bring the boats along. Then Captain Tyson said we had better go, and we pulled our boat over the ice four or five miles. Mr. Chester's boat-crew gave us a hand; notwithstanding, it took us seven hours to get the boat on shore. Then we went back and got our clothes, stockings, &c. It took us two days. We then started for the ship. Mr. Chester stopped and laid right in the mouth of Newman's Bay. He had orders, he said, to bring the two boats with him, and he had no chance to come down; there was too much ice.

We could not take the boats back to the ship. We could not have gone over to Cape Union at the time we left to come back. There was too much ice. The ice had come down in the mean time.

We got back to the ship. She lay in Polaris Bay at anchor. We went on board and found the ship was in a very leaky condition. Then they kept up steam and pumped all the while with steam. We heard that the captain wanted us to return from Newman's Bay, in order to save coal by having us help at the pumps. We were ten or twelve days on board before Mr. Chester came on board with his men. He sent some of his men before him—Mr. Meyer and two others. One came the very time that Captain Tyson's boat-crew came. When Mr. Chester came on board the next morning we started the deck-pumps and stopped the steam. Then we were waiting to get a chance to go up north, at least as far as these boats were, so that we might get them. Captain Buddington said that he would endeavor to get farther if he could, but the effort would be to get as far north as these boats were at all events. The ice opened a little and by hard squeezing we got the ships squeezed on to the beach and remained there. For a day or two we were not afloat at all. On the 12th of August the ice opened and we steamed down south. We did not go up north to the boats. We could not. I heard Mr. Chester and Captain Buddington talking about going north, and he said they would try to get as far north as possible if an opportunity offered, but then there was no chance, and we thought if there was no way to get north we had better steam home. It got to be so late—it being the 1st of August. Another man and myself, Robert Kruger, asked permission to go and get some clothes that we had left in our boats. We got permission, and we went and we stood about twelve or fifteen hundred feet on a high hill and on the southern side of Newman's Bay. We there saw the farthest land that has ever been seen.

Nobody has ever seen that land but Robert Kruger and myself. It was behind Cape Union. It run northeast by east. Standing at the southern end of Newman's Bay, and looking due north, just a little to the right of Cape Union, we saw the land running northeast by east to the northward as far as we could see. We lost that land from its running behind Cape Brevoort. We were about a mile on the south side of Newman's Bay. We looked up due north, and saw the land of Cape Union, to the right of it, until it was lost to us behind Cape Brevoort. It seemed to be the same height that the land is abreast of Newman's Bay. We could see snow in the ravines coming down the steep coast in this new land. We saw it when we came down for about ten minutes or quarter of an hour. We had not seen it before; we had seen appearances of land there. Captain Tyson, and the others, also, called it Fly Away Land. We thought before that it was land. Some of them said it was a black sky extending over the open water, and said it was an open Polar sea; but we saw it, this last time, just as certainly as I have ever seen anything. I saw nothing of land, to a certainty, when I was up at Crow's Nest, while they were having a consultation below. I did not report any land at that time, though I thought I saw some on the east side.

When we were up at Hall's farthest point, I saw the north cape of Hall's Land. I was up in the Crow's Nest and I saw, to the northeast of Hall's Land, the other land—high land away up in the northeast, as far as I could see. I did not see any other land, only the big bight that went in from the cape that is just above Repulse Harbor. It was not a very clear day when the ship reached its highest point, though I could see a great distance. I could see water for twenty and twenty-five miles at least, and could see across the straits. This was on the shore of Newman's Bay. It was a beautiful, bright day when I went up for my clothes, where we had left our boats, and when we saw

this farthest point of land. Mr. Meyer went out to see if he could see it, but he came back and reported that he was not able to see any such land as was described by us. He said he was not willing to mark anything down that he had not seen himself. When he went out, however, it was a very foggy day.

Without concluding the examination of this witness, the Commission adjourned until Monday morning, at eleven o'clock.

WASHINGTON, *October* 20, 1873.

Examination of HENRY HOBBY resumed:

After seeing the land, which I described on Saturday as being the most northern land seen by any one, at the time when I went back to Newman's Bay to get my clothes, I returned to the ship. The ship laid about ten days or more in Polaris Bay. Then we steamed down south. We stopped in Polaris Bay that length of time because there was no opening by which we could get out. On the 12th of August, at dinner-time, there commenced to be open water and slack ice in the straits. We got steam up and steamed down south. We were getting along well as far as 80° 2′ north. There the open water stopped, and we ran the ship till she got beset in the pack. We drove slowly down along the western shore, the ship all the time setting slowly more over to the Greenland side. A house was built on the ice so that we might have shelter in the event of our losing the ship. We had some provision in the house. Captain Tyson had that done. We drifted down fast to this ice, until the night we broke adrift in the gale. We could not have gotten on to the western shore at any time after we got fast in the channel. We were blocked in. After we passed Dr. Kane's winter-quarters we drove down rapidly. Passing Cairne Point we saw plenty of open water. The trouble, however, was that the ship was frozen in to one floe. The open water was to the northward, to the southward, and east and west of us. We, however, were frozen in to one big floe, and there were some other floes in the pack where we were. We drove past Cape Alexander and saw Northumberland Island from the deck. A heavy gale commenced from the southwest. It was snowing and blowing fearfully for about thirty-six hours. In the evening at 6 o'clock it was dark, and all at once a heavy crack in the floe came. Two of us jumped up on deck. We saw the floe was parted right where the ship was lying. In about five minutes all the ice was gone on the starboard side. Captain Buddington called all the hands to get the musk-ox skins, provisions, &c., ready. We did not commence right off to heave overboard. We had provisions on deck and coal. The musk-ox skins and clothing we had to keep dry in the room. We got them up in port-alley way. We waited a little while, and all at once we got a nip on the starboard quarter. A big floe or a little berg struck her there fearfully, and keeled her over on her port side. Then Captain Buddington sung out, "Heave up all you can, as fast as possible." Some of them went on the floe, and others threw the stock overboard, forward and aft. Three of the party brought the things forward to us, and Mr. Chester and I hove them overboard. Captain Buddington, Mr. Morton, and some others were aft. We had the pemmican aft on the poop-deck. He threw that overboard. I was forward along with Mr. Chester. We did not heave everything overboard that was there. Then the men sung out that they wanted the boats

lowered, and we lowered two boats down. They did not like to stay, they said, any longer without the boats. When we had the two boats down, we commenced heaving more provisions on the ice. Then Captain Buddington and Mr. Chester spoke together, and said it was better to stop a little while, and not to heave everything over just then. We waited for a couple of minutes, and then Captain Buddington said that I should go over on the floe, and should carry the provisions that were on the floe-edge, alongside the ship, out on to a higher part of the floe, where we had the house. I just went over the rail, and went down the lower part of the steps. Through the heavy nips the ship had had, the floe was broken up, and there was about three fathoms there broken up in little lumps of ice. I was, therefore, unable to get off. I sung out to the captain that I could not get off that way. He said you had better come up. At the same time the steward came running up. He was on the floe. I stood on the lower part of the steps; and he says the floe is broken all over, and I must come on board. The captain says I have just ordered a man off, and if he cannot get off, why you cannot get on board. He said I must; the floe is broken all over. Just at that minute off went the ship. The fastenings broke, and the ship went off. There we could see three-quarters of the provisions on this little piece of ice yet, and there were about four or five men on it. Some of them were on the better part of the floe. Those that were on this little floe were shouting, and saying they wanted to get on board of the vessel. The captain said, "I have got no boats on board, and I wish I was where you are." We all wanted to be on the floe. We had no boats, or anything of the kind, and the ship was in a fearful condition. We drove away, and that was the last we saw of them. The steward sung out, "Good-bye, Polaris." Those were the last words we heard. That was about half past 9 in the evening. At 11 o'clock our ship laid still, I think. We could not see any land. The snow was blowing, yet it had calmed down a little. All around the ship there were broken pieces of ice. The next morning at 9 o'clock, we saw the land on the Greenland side. We saw that we were about three miles from the coast. At 9 or 10 o'clock, I went up to the masthead, and I saw a lot of provisions about four or five miles from the ship. I could distinguish the coal-bags, the boxes, &c., one from another, but could not see any boats, any house, or any living man, and no dogs. I was looking through a glass. I saw these things from the deck also, and when I came down I could show it to the others around. The floe was a little to the southward; more to the southward than abreast in the straits from us, a little to the southwest of us.

Mr. Chester went up and saw the same thing that I did. Afterward Captain Buddington sent me up again, but I could not see any men. I went right up as high as I could get on the topmast with a glass, and I could not see any movements or anything of that kind. This was about 12 o'clock in the day. Then we had gotten steam up in the little boiler. We had steam up, but the captain ordered more steam in order to use the propeller. We had got steam up to pump the ship with. Then there was a little bit of a lead opened into the shore. A slight breeze sprung up from the northeast. A little bit of lead opened into the shore and we tried to get in on to the beach. It took us until 4 o'clock in the evening to get on to the beach, working with sail and steam, but there was no other open water to be seen anywhere except a little to be seen toward Littleton's Island. We made toward the main land, between Littleton's Island and Life-Boat Cove.

She was beached where the fall of the current swept along. I would

have beached her two hundred yards farther down south, around the point.

The next morning we commenced to take the spars, topmasts, yards, &c., down, and take them on shore. We took all the provisions we had left on shore. Two days afterward there came some Esquimaux to us. The captain gave them several things, and in the evening they went home. The next day there came six of them. They helped us to take all the stuff on shore. I cannot think of anything just now that happened during the winter. We remained there, however.

In the spring the doctor wanted me to go to the North Pole with him on a sledge journey. I thought it was a very foolish idea, with fifty pounds of pork, and sixty pounds of bread on one sled, to go to the North Pole from there. At this time we were two hundred miles farther south than we were the year before, and yet we did not try it then, when we were farther up. I was told to go, however, and I said I would go; that it made no difference to me. The doctor promised me $100 to go to Thank God Harbor, and $200 if I would go with him so that he could reach a higher latitude than Captain Parry reached. His principal object seemed to be to go to Thank God Harbor. What he was going to do there I could not say. The captain bought a team of dogs and sleds from these wild Esquimaux who came there, and we had those at the time. Dr. Bessels was constantly speaking to me about going to Thank God Harbor with him, and we had arranged for such journey, but before we were able to start, the ice broke and the journey was accordingly abandoned.

We lived in the house that we built all the winter. A fortnight before we left, a gale of the northeast took her about one hundred yards farther south, and then she broke out in open water. The hawsers were parted, and Herman Seimens and I made one of the hawsers fast to her again. She only was twenty yards from the beach. Before, she was about one hundred and fifty yards from the beach. She was three-fourths full of water at the time. The high tide forced her up on to the beach. We made fast only a single hawser. We were not told to do this, and we had perhaps no business to do it, but we took the responsibility. If I had had anything to say I would have secured her properly at that time. When we went away with the two boats that Mr. Chester built, we passed right in front of her stem, and she was lying there level with the water. We sailed down that day in sight of Littleton Island. We passed Cape Alexander and down to Etah, the second settlement from the north. Then we traveled along very comfortably. Nearly all the while we had abundance of water. We got pretty rapidly down south, and on the 23d we saw the whaler Ravenscraig. Some of the party were glad to see her, while some were very sorry. We did not want to go across to the other side for two or three months. We thought we could get to Tessiusak in ten or fifteen days. We had made more than half of our passage down in twenty days, and had six weeks' provisions more in our boats, and everybody was in excellent health. We thought we could get down there sooner, and, as we had plenty of provisions on board, would have preferred remaining on the boats. I wanted to go to Disco, and all in our boat wanted to go there. I am sure we could have reached Disco without any difficulty. Mr Chester did not want to go on board the whaler, but Captain Buddington did. We had not eaten more than one-third of our provisions at that time.

At the time our ship went adrift from the ice-floe and we were separated from our companions, she was in a fearful leaky condition. I was down in the fire-room, and saw that the water was just coming on to the fires.

We had to start the deck-pumps as quickly as possible in order to prevent its doing so. We had to thaw them out first with hot water from the boilers. We must pump with the deck-pumps or the engineer said the fires would go out. Everybody was working as hard as he possibly could. The stem of the ship was gone; the six feet of it was broken out. I could stand right in the hole. When the ship went on Providence Iceberg on the 22d of November, 1871, Captain Buddington said that it was the safest place we could have her. All of us said the contrary; I had never seen a ship setting on the ground the whole winter, and this was the same; she soon commenced to keel over a little, and kept keeling over a little more and more all the while. She was leaking fearfully all the winter. When she had set about a fortnight, then the captain thought it would not be a good plan to leave her there during the whole winter. It was then, however, too late. If he had come to this conclusion before, she could have been gotten off in about an hour's time. We could have sawed her off. There were only two or three inches of ice on the port side. That is where she got her break in the stem. During the winter she was cracking sometimes fearfully. In June, of 1872, we found out that the ship was leaking badly. I knew well enough before that it could not do anything else; that it must be leaking. That discovery was made when we commenced thawing out of the ice. She had broken the stem; the piece did not come out at that time. We tried to fix it. The big planks were broken right in the middle square off, and the stem was bent regularly away for two or three inches. After we ran her on shore the morning after we parted from our comrades, as we were walking over the ice taking things on shore, I went forward to her stem and saw how she looked there. The lower part was all away at the six-foot mark. A large portion of the stem had come out the night that we parted from the floe. She was built up solid forward, otherwise she could not have floated after that. She was a strong ship and a very comfortable one. She would have been right enough if she had not been kept on that iceberg all winter. The nip that she received the last night would not have done her any harm. She would have stood that all very well. This break on top of the old one caused her destruction.

Q. How often did you go to the mast-head to look after your companions?

Answer. Twice. I staid there from ten minutes to a quarter of an hour at a time. Everybody was very busy taking care of the ship during that time. The first time I was up there I was called by the captain to attend to the other business. It was while they were eating breakfast that I went up to the mast-head. The first time I went up on my own hook; afterward I was sent up by the captain. The time that Mr. Chester and I were up at the mast-head altogether would make about an hour and a half in that day. There was nobody looking from the mast-head about 4 o'clock in the afternoon. I think the reason why we did not see them was that they must have been behind Littleton Island, or in the shadow of some berg. There was no men on board the Polaris that could beat me in seeing. That is what they all admitted, that I had the best eye-sight. I was regarded as the best look-out on board. I could distinguish a bird while it was flying, and see whether it was a bird or something else, when the others could not tell what it was. I have very fine eye-sight. I do not see particularly well through a glass; I can see with my bare eyes better.

There was a great deal of refraction in the atmosphere in that region. I saw a great many mirages, and have seen ships and land lifted up

which would otherwise be below the horizon, and not visible. I do not know that there was anything of that kind the day that the other party saw the ship. I think that if they had been anywhere near the floe that had the provisions on, I should have certainly seen them.

The land that Mr. Kruger and I saw farthest north, when we went to get our clothes where we had left the boats, consisted of very high peaks, coming steep down to the coast, apparently. We could see the snow-ravines between the peaks. There did not seem to be any capes there, but the land seemed to come straight down as we saw it. It lay off northeast by east, and not up toward the west coast from where we saw it at Sumner Headland, at about an elevation of twelve hundred feet. We could see it until it stretched off to the northeast, and was lost behind Cape Brevoort.

It was a splendid day when we saw this land. When we were on the boat excursion we had been in there for a month, and we were not always able to see Cape Union, but at this time Cape Union looked as if we could heave a stone on it, it was so near. I had no glass. Kruger had Mr. Meyer's spy-glass.

When we first went up in the Robeson Channel the ship could have gone farther north. After they had the consultation on the house, which was on the 29th of August, I think, we could have gone farther north. And I think we could have gone farther north after we got back into winter-quarters. We had a gale from the northeast, and we drove down with that from our high latitude to 81° 38′. That cleared out the channel, and we could have gone on north after that. I am quite sure we could have gotten as far as we did before, at least. There was then blowing a little breeze from the northward, but not much, and there was no ice coming down at that time. That, of course, showed that there was open water. The reason we did not go farther north was because Captain Buddington said that it was not safe to go farther north; that we had not left any depots of provisions anywhere. He said we were a thousand miles from our first depot. Mr. Chester wanted to go to Newman's Bay, at least. He was waiting the whole day to heave anchor to go north. That was the first day we lay at Polaris Bay. Captain Buddington said this that I have just repeated, about not going any farther north, forward on the deck. It was spoken in the presence of every one. When this consultation on the house was had, Captain Hall, Captain Buddington, Captain Tyson, Mr. Chester, Dr. Bessels, Mr. Meyer, were present. Captain Hall asked every one of them, and they all said they wanted to go north, with the exception of Captain Buddington. Captain Buddington wanted to go into Newman's Bay and make winter-quarters there. The others wanted to go north. Tyson wanted to go into Newman's Bay also, if they could not get north on the west side. The rest wanted to go north. There was open water to the northward at that time. The ship was then lying in open water. Some of them wanted to cross the straits, and some of them wanted to keep the Greenland coast. The open water was on the Greenland side. Some of them said it would make too much easting, and the others said that she never would get across those straits; that she would get fast into the pack. That is what Captain Buddington said. We tried to get across the straits on the other side, and did get fast.

I remember when Captain Hall was sick, and when he died. I was not with him at all; we were not allowed to be with him. I saw him only once, and that the Sunday when he was quite well. He died in two or three days after that. I only saw him the one Sunday I have spoken of. After his death I never heard any one express himself as

being relieved by his decease. I know there were a couple of officers who were greatly relieved by his death. The doctor was one of them that I know of. I think Captain Buddington was also. I never heard them say so; I could see it by their works. One of the officers said that now they would have something to say; that before the sailors had the command; that Captain Hall consulted with the sailors, and not with his officers. They said that they would find it a little different now. Mr. Meyer said that. He remarked that now the officers would have something to say; that they had nothing to say before. I know that the doctor was greatly relieved. He did not know what to do when Captain Hall was alive. When Captain Hall would call one of the scientific men all three of them would jump up, and each one would suppose he was called on. Some of them did not want to behave very well. Captain Hall said he would court-martial the doctor if he kept on in the way he was doing. Nobody ever said in my presence "that there is a stone taken off my heart now," referring to Captain Hall's death. Captain Buddington said to me at one time, "We are all right now." He said that the very same morning that Captain Hall died. I said, "How do you mean about that?" He said, "You will have plenty to eat now, and you shall not starve to death."

The discipline of the ship was good during Captain Hall's life-time—first class; afterward it was not very good. The most I can say of Captain Buddington is, that he knows how to manage a ship in a first-class way, and is a first-class ice-navigator; also Mr. Chester.

Examination of Hermann Siemin.

I am a native of Germany, and thirty-one years of age; by profession a seaman.

I have sailed from Germany, England, and from America. I passed the examination before a board as a ship-master in Germany, in 1868. I never commanded a ship. My highest rating has been first officer on board of a Nova Scotia sailing-vessel that sailed out of New York, named Eolus, Captain Perkins. I never sailed in the Arctic circle before the time of the Polaris expedition. I joined the Polaris in Washington. Nothing remarkable happened until we reached Tessiusak. Tessiusak was the most northern port we made. From that point we went directly north. The first place at which we landed was with Captain Hall, and Chester, and four men, of whom I was one, at Cape Frazier. Captain Hall could not find any winter-quarters there. Then we went farther to the northward, and by Cape Lieber one day he stopped the engine, to get proper observations to ascertain in what latitude Cape Lieber was. He had the whole scientific corps and the officers on board to take observations in order to discover this exactly. Then we had to stop the ship for a time at the place, because the weather was so thick and foggy that we could not see her course. One morning, I do not remember exactly the date, we got our highest latitude at about 6 o'clock. I went myself in the crow's-nest to look out. I was asked if I saw anything to the northward. Farther to the north I saw no lead, nor did I see any prospect of getting any farther north. Captain Hall then concluded to look for winter-quarters. In about 82° 9′ north latitude we looked for winter-quarters, but the current was a kind of a maelstrom—it turned around and around, so that there was no place there for the ship to make winter-quarters in. This was above

Newman's Bay, at Repulse Harbor. Then we went farther down, but could not reach the coast, and could not find any better place. We were looking toward the west coast for winter-quarters, because that land was more to the north than the east coast was. Greenland turns too far to the east, but we could not reach the west coast. We drove down from the latitude that Captain Hall said was 82° 26′ until we reached winter-quarters in 81° 38′ north.

The next day we were engaged in looking toward the southward for winter-quarters, but we had to return. Thank God Harbor is not a bay, but only a bight, and there is no shelter there from the southerly and southwesterly winds. But we could not find any better place, and so we returned in the evening to our old harbor again. We then commenced putting the provisions and stores on shore as quickly as possible. After awhile, Captain Hall made a sledge journey to the north. When he came on board, so they tell me, he stated that he had not been in very good health during the last three days of his journey. I saw him when he came on board, but did not speak to him. I did not speak to him at the time, because I was one of the tide-observers, and Henry Hobby and myself were working the snow out of the tide-pond. Some of the officers said that he was not well the last three days of his journey. I don't know who it was that told me he hadn't been feeling well, but some one told me so. I did not see him during his sickness. I asked Captain Buddington for permission to see him, but never had the privilege. He told me that he would see what he could do for me. That was all the information I got from him. I did not see him at all while he was sick. I asked Dr. Bessels about Captain Hall, and he told me that he would not get over his sickness. This was after he had been taken sick, but before he got so very sick the second time. After he died we buried him. That was all, really, that I know about it. I never heard any formal announcement of who had command after Captain Hall's death. Dr. Bessels told me that everything would be the same as it had been, with Captain Buddington as sailing-master; still, we lost everything when Captain Hall died. I mean by that, that in my opinion the expedition died with Captain Hall. No ship ever had the privilege we had. I was with Mr. Chester twice in his boats. He did what he could, but the thing I did not like was, there not being any sledge journeys. The straits in the spring were so that we could have crossed them toward the west coast of Grinnell Land. The ice was not moving at all. But it was not done. I have no doubt if Captain Hall had not died that we would have reached the highest land on the west coast that Mr. Meyer has laid down on his chart. We could not have gotten any farther north with the ship than we did go, I think. As I stated, I accompanied Mr. Chester in his boat expedition. At that time, we got in the mouth of Newman's Bay. I did not go any farther except that I went on the shore with a telescope, and went some miles behind Cape Brevoort. I looked to the northward, and I think I saw land, but I cannot say for sure; but my belief is there is land there. This land that I speak of lies across above the land laid down on the chart, and stretches from west toward the east. With the telescope, I could see an opening from between the coast-line on the west side, as laid down on Mr. Meyer's chart, and the land which I saw stretching off and running off toward the east. The land was so far off that no one could see exactly how it lay within a point. This land lies behind a steep cape not laid down on the chart. From the highest point on the east coast, as laid down on Mr. Meyer's chart, I saw still to the northeast of that a high cape with

water between that and the point put down by Mr. Meyer. I could not see whether it was a bay that lay between the two capes, or whether it was a sound. I could not see land to the southeast and do not know whether it joined it or not. This farthest land which I saw was still farther north than this cape I have spoken of, and ran off behind it with, I think, water, and an outlet between, toward the northeast. The glass I had was one of Mr. Meyer's large telescopes; a heavy one; one man had as much as he wanted to do to carry it over the mountains. I could not see this land with the naked eye. It was a very fair, bright day when I was there making this observation. I told Mr. Meyer of it when I came back, but he never saw it himself. When I came down from the boat journey they were looking for a chance to go toward home. Mr. Chester staid on his boat journey as long as he could for the purpose of seeing if he could not find an opening. I believe if he had seen an opening that he would have gone to the north with the boat we had. There was, however, no opening. There was not even sufficient to take the boat down to the ship, so that we had to leave the boats and everything there. Then, on the 12th of August, we left Polaris Bay for home. We got a little lead, and pushed our way through the ice. Thus we steamed so until we reached eighty degrees and two minutes north, where we got beset in the ice. Then we had to make our ship fast for the first time in coming down; we drove in about a month and a half. I do not remember exactly the time when we got beset, but we drifted down in the pack-ice until we got this smashing up, when the Polaris got stove in; we drifted down the pack-ice until the 15th of October, when we got a gale from the southward, and in the evening about 6 o'clock the ice separated from the starboard side of the vessel. About half past 9 o'clock, after the ice separated, it came in again on us, and nipped us. When the ice came in again, Captain Buddington gave orders, while the ship was cracking all over, to land the provisions on the floe. Some of the men went on the floe to transport the provisions; at half past 9 we broke loose and drove away, and left the party on the ice. We drove for some distance in open water, and then brought up in slush ice that would not bear a man's weight. It had been made within a day or two before in the bay. When we drove away from the party the water was beginning to come rapidly into the ship. We had to take the hot-water out of the small boiler, so as to make the big deck-pumps work. We had to thaw the ice out of them. The engineer in his department was below, and made the fire up. He burned blubber, wood, and everything that he could get, to get steam up to run the pumps, so that we would be able to pump her with steam. Just before the pumps were working, Mr. Shuman told me that the water was nearly up to the furnaces, and came very near putting the fires out. After he got the pumps to working by steam, we got the better of the water. Thus we were enabled to keep up until the next day. We then worked our way toward the coast of Greenland with lines, sails, and sometimes a few turns of the propeller, until we reached in the evening the coast. But we could not get upon the ground for the ice which lay on the shore. We got as far as we could, and when the tide went out the vessel was on the ground. The next day we had worked the ship still closer into the shore, as close as we could get her, and then fastened the hawsers to the hummocks that were aground, so that she would not drift off again. Then we commenced to bring the provisions on to the shore, and we took the spars down and brought them on shore. The next day Mr. Chester turned to with a couple of men and commenced to build a house. The Esquimaux came with five sledges and assisted us

in getting the provisions and everything we could from the ship on to the shore. After we had everything out of the lower hold, Captain Buddington gave orders to let the engines stand. There was then no more pumping with the engine, and we were therefore forced to let the Polaris get full of water, because the stem was broken off at the six-foot mark, and totally away from the ship, so that a man could stand in the opening where the piece of stem had been. Even the boards and sheets of iron were bent out. We fixed our house on the shore, and tried to make ourselves as comfortable as possible, and there we lived through the winter.

The next day after we parted from our comrades we kept a sharp look-out for them. The chief officer was in the "crow's nest" the whole of the forenoon. We were not able to see any of the men. Mr. Chester went into the "crow's nest" with a glass, and looked around and around for them, but could not see anything. As far as I know, there was some one at the mast-head in the afternoon. I cannot say whether anybody was at the mast-head at 4 o'clock in the afternoon or not; but Mr. Chester, while we were going into the shore, was up in the "crow's nest" looking for leads, at the same time that he was looking for the men.

I kept a diary. My first diary was published in the other report. I kept one afterward. These diaries were written each day as everything happened, and will give my story more particularly than I can remember it now. Of course, a man cannot remember everything that occurred two years since, and I would not like to say before God and my Government what is not exactly true. We started from our second winter-quarters at Life-Boat Cove the 3d of June. The boats had been made under the directions of Mr. Chester. We made our way down about twenty five miles below Cape York. We had pulled upon the ice, and were watching for a lead when we saw the Ravenscraig fast to the ice-floe of Melville Bay. We were taken on board of her, and went with her across the channel, Lancaster Sound, over on the west coast. We afterward went on board the Arctic, and, when she was ready to sail, we went with her to Dundee. Three of our comrades, Mr. Bryan, Mr. Joseph Mauch, and Mr. Booth, were left on board of another whaler called the Intrepid. The whalers leave the whaling-ground about the middle of October, and it is nearly or quite time that we should hear from them. If we had not fallen in with the Ravenscraig, I think we would have gotten down to Upernavik or Disco in our boats. If we had not succeeded in reaching there, we would probably have been picked up by the Juniata or the Tigress.

In our first winter at the north I found on the south side of Newman's Bay, a mile and a half inside of Cape Sumner, in a distance of a quarter of a mile, twenty-four pieces of drift-wood.

With a northerly wind they would have just come from that opening that I had seen to the northward, and which I have described as being between the west coast and the fartherest land which I saw.

They would sweep just clear of Cape Union and drift on to the southern coast of Newman's Bay. We burned some of this wood to boil our coffee with and cook something to eat. I cannot remember the size of these pieces, but that is given in my diary. I would remark that in the statement of the length as given in my diary it is not stated whether it is feet or inches; but I meant to have it inches. Some of the men took a few pieces of this wood on board the ship and gave it to Dr. Bessel. The rest we used up or left. I cannot say what wood it was. I believe the doctor had a name for it. It looked to me like hard wood. (Pieces

of wood exhibited by Dr. Bessels while giving his testimony were here shown Mr. Simmons, and he said, "These are the same kind of wood, and look like some of the pieces.") The greatest length of any of the pieces I found was about eighteen inches. At Polaris Bay we found musk oxen, abbits, lemings, some birds, in the summer time, of different kinds, and got one white fox.

As regards vegetation, there was a kind of grass there. I do not know what the name of it is in English, but I should call it in German "heide." We came across little grass plains, and met with flowers in the summer time. During the summer season the land was pretty clear of snow, with the exception of some deep ravines.

I saw the track of the glaciers in Newman's Bay, and I have even heard a glacier discharge. I heard one discharge below our winter-quarters where the place called Southern Fiord is. I have seen stories in the papers about Captain Buddington's drunkenness, but I have never seen him so drunk that he could not discharge his duty. He is a fine sailor, and a splendid ice-navigator.

I will state that the more particular details of what I know will be found in my diary. Statements therein contained were written down by me every day as the circumstances occurred.

Examination of Alvin A. Odell.

I was born in Connecticut; shipped as second engineer on board the Polaris at New London; sailed with the ship from New London on the 3d of July, 1871; went with her to St. John's; thence to Fiscanaes, thence to Holsteinberg, thence to Tessiusak, and thence northward on my northern voyage. After we left Tessiusak we proceeded to the northward. I was in the engine-room most of the time, and was not, therefore, very familiar with what transpired on deck, and of course did not see as much as those who were on deck. I sometimes ran out, and what I saw was at those intervals. We proceeded to the northward through the ice as best we could. The particulars I am not able to state, for the reasons which I have before given. After we had got along for some days—a few days before we went into winter-quarters—we got beset in the ice in a strait which Captain Hall called Robeson's Channel. After we got beset in that ice, we got out afterward, and went up still farther in the channel above a cape, which he called Cape Lupton, and a bay, lying eight or ten miles above it, which he called Newman's Bay. We afterward drifted down in the ice from the highest point we reached, which I understood to be, after the latitude was corrected by a scientific observation, 82° 16′, to the point where we went into winter-quarters, at a latitude that was said to be 81° 38′. After we had gone into winter-quarters we landed our provisions on shore, and set up an observatory. We banked the ship in with snow, and covered the house with canvas, and made ourselves snug for the winter. About the 10th of October Captain Hall made a sledge journey to the north, accompanied by Mr. Chester and the two Esquimaux, Joe and Hans. While he was gone, we were engaged in making ourselves comfortable in our winter-quarters. He returned about the 24th of October. I saw him when he came back at the gangway. I shook hands with him, and he wanted to know how we did. I told him "pretty well." I told him we were banking up the ship. He said he was glad to hear it, and smiled, and went in. He said he was pretty tolerably well, as far as I

could understand. There was not much said, but from his looks I thought he was quite well. After that it was but a little while before I heard he was sick. What was done I do not know exactly, but I heard, after a while, that he was getting worse, and that he kept getting worse. Some little of the time, I believe, he was better. In a few days he died. Shortly before he died I looked up in the scuttle, and I saw that he was walking up and down, and I thought from that that he was getting along nicely; but the first thing that I heard was that he was dead. I was not in the cabin with him during his sickness more than once; he was sitting up in his chair then. I had a minute's conversation with him. I do not remember particularly what he said. I did not go into the cabin again, and therefore did not see him until he died. Captain Tyson, Mr. Morton, and I laid him out after he was dead. We buried him on the 11th. I did not take any particular notice, and did not hear much about it. I have no reason to suppose that he died anything else than a natural death. Captain Buddington went into command after his death. After that time we made ourselves as comfortable as possible. We did not do much of anything. Once in a while some of the party made a sled journey. The next spring an expedition was made in boats. The scientific operations went on during the winter, as far as I understood.

Shortly after Captain Hall's death, in a gale, the ship broke out from her anchorage and we drifted against an iceberg. She was made fast there, and rested on the spur of this iceberg all winter, rising and falling with the tide. She would right up a little with the high tide, and as that fell she would fall over, resting with her stem on the spur of this iceberg. She strained herself a great deal during the winter, and in the spring, when we got clear of the ice, we found her in a very leaky condition. We found the water coming into her very rapidly. We got pumps to working then. We managed to do this by hands changing off. One gang would take hold and work at one time, and then another. We did not at first pump by steam. After a while we found she was making pretty free, and we used the steam-pump.

We had to wait until the men came back from the boat expedition, and then we worked the pumps by hand, and discontinued the working by steam. We had been using the small boiler, but worked the big pumps by hand, thus saving our fuel. After the boats were gone we tried three times to get to where they were, but were not able to get past Cape Lupton, though we got abreast of it each time. We had to go back each time into our old quarters, and finally staid there until we started to come home on the 12th day of August. We made our way south slowly through the ice, there being slack ice all around us, and finally got stopped in the pack again in the middle of the channel. After we got beset first in going south we got free again, and got out into the channel, and then got into another pack, and there we got fast. We tied up to an old floe which was very large and solid, about two or three miles long. We drifted to the southward and past Cape Alexander into Baffin's Bay, and were thus situated until about the middle of October. Then there came that heavy blow and gale and snow-drift, and we were separated from the floe. The ship got a pretty severe nip, and that caused her to break loose from the ice. We were thus separated from our companions on the ice while we were in the act of taking off the provisions and materials which were on deck, ready to be put on the floe in case of emergency. I was below when the thing happened. I was assisting about, and once in a while I would run and help heave over some things until we found that the water was increasing very

rapidly upon us; then I went to the hand-pumps and commenced assisting there until we got steam into the little boiler again. The water came in so rapidly that it was all we could do with all hands working, to keep the water from the fires. After we separated we had to keep pumping very hard until we got steam up, and then we began to pump by steam. The next morning we saw where we were; at least we made out after a while that we were up by Littleton's and McGary's Islands, within a couple of miles of the shore. The ice was a little slack. We had steam then in the little boiler, but we had to get up a pretty good pressure, and then set the engine to work. We would run the steam all off, and then we would have to stop and get up steam again. We would get fifteen or twenty pounds; then we would put it on; and by that means we ran the vessel on to the rocks; ran her aground, and got all the things out and such provisions and coal as we had on board. The loose ice by the side of us froze together after a few days. We then took the provisions ashore, and had a house built there from the wood we got out of the vessel, bulk-heads, and such other parts. We covered the house with canvas and spent the winter at that place. The next morning after we got adrift from the ice, Mr. Chester went up into the "crow's nest" to see if he could see anything of our other party, but he could see nothing of them. He had an idea that he saw them at one time. He thought he saw something that looked like bags of coal, but afterward he concluded that he was mistaken—that it was nothing but black ice. We wintered there as well as we could. The Esquimaux came to see us, and were friendly disposed, and helped us all they could. In the spring we made boats. Mr. Chester, the carpenter, and all hands set to work doing so. I did what I could during the time. On the 3d of June we left our winter-quarters and went south; and when the ice prevented us from going, we hauled up till it opened for us. So we worked our way down below Cape York, when the Ravenscraig hove in sight. After awhile we went on board of her, and crossed over the bay with her to Lancaster Sound, and were with her there while she was whaling during the summer-time, till she left in September, until the whaler Arctic came along, pretty nearly full, ready to go home, and we were transferred to her to sail for Dundee. I do not know the date of our arrival at Dundee. We afterward came on to Liverpool, and thence sailed for the United States in the City of Antwerp, and arrived in New York, at the Brooklyn navy-yard. I kept no journal. My duty was below, in assisting at the engine. Of course I did not see as much of what happened as those on deck. I did not have the same opportunity. I have given a general statement of what occurred.

During Captain Hall's life-time the discipline of the ship was very good. Afterward it was not so good. Captain Buddington would get pretty well "set up" once in a while. I cannot say that he was drunk, but he would go around like——Captain Buddington was a pretty easy sort of a man, and rather familiar with the men, and that made discipline rather loose. I never heard anybody say that they were relieved by Captain Hall's death.

I do not think I saw any chance to get farther north in the ship than we did get at any time. The ship was severely injured when she broke from the ice, the time when we separated from our comrades. She was making a good deal of water at the time. It was as much as we could do to get into shore at Life-Boat Cove. I did not see much difference between the temperature of the second winter and the first. There was a little more snow farther south. I do not know whether Captain Hall kept any journals or records, and, of course, I do not know what became of

them. We had a very good crew. Everything went on peaceably. There were no outbreaks of any kind that amounted to anything. I do not think that the Polaris was exactly of the right build for a ship to go north; but she was very strong. The machinery was very compact, but a little unhandy; but we got along with it, however, very well indeed. It was in good condition. I do not know of any disagreement between anybody and Captain Hall. I have heard there was, but I do not know anything about it. Captain Hall was a very kind man. He was quick once in a while, but he was a man very easy to get along with.

Examination of Nathaniel J. Coffin.

WASHINGTON, *October* 21, 1873.

I am a native of Portsmouth, N. H. I learned house-carpentering and joiners' trade in Portsmouth, N. H. I worked at ship-carpentering on the Pacific coast some, and in Portsmouth, N. H., navy-yard, and in Washington navy-yard. I shipped on board the Polaris here, at Washington, and sailed with her from Washington as far as New York, where I was taken sick. I was afterward sent forward by the Congress, and rejoined the Polaris at Disco. I sailed with her from Disco to the north. Nothing of importance happened other than Captain Davenport coming on board the Polaris and reading the object of the voyage, &c. There was some little misunderstanding between Captain Hall and Dr. Bessels, I think. Captain Hall stated that he had been insulted by Dr. Bessels. He stated that in the cabin before all of us. It was at the time that he read off the duties of every man. I could not say exactly where that was, but I think it was just before sailing from Disco. Afterward we proceeded on to Uppernavik, and then went to Tessiusak to get some seal-skins and dog-skins at those places, and secured one of the guides—Hans and his family. From Tessiusak I think it was we went on north. The first place we came very near, I think, was near Cape York and the conical rocks. From there we bore over to the western shore and went up by Cape Frazer. There was a boat put off there, I think, in an effort to find winter-quarters, as I understood it. After that we got beset in the ice and drifted farther south, so Captain Hall read off in the cabin. He read off either before or after Sabbath service that we were in latitude 82° 26′ north, and thought we had drifted into 83°, but was not certain. That was after we got into Polaris Bay that he read this off. We had drifted and come down very near Polaris Bay, and the ice opened. After we left Cape Frazer we passed up through Kennedy Channel, passed Cape Constitution on the one side, and passed up through what was formerly Kane's Open Sea, now called Polaris Bay or Hall's Basin. We passed Lady Franklin's Bay on the west into a channel with land on both sides up to a latitude which Captain Hall called 82° 26′. There we got beset in the ice, and after some time drifted back to the strait. We drifted sometimes backward and forward with the tides. I heard Captain Hall state on board the Polaris that he thought it was possible that we might have drifted to the north into latitude 83°, but he was not certain. While we were beset, we put out a great deal of our provisions on the ice, for fear that we would have to abandon the ship.

When the pack began to loosen, we loaded the vessel, put the things on board again, and when the ice was open I believe there was an attempt made to go farther north. We found this Polaris Bay,

and then made one attempt to get farther north, but we failed. I remember Captain Buddington saying to Dr. Bessels that we were about two inches farther north, he thought. That was when we got back again into Polaris Bay. We anchored there, and sent things ashore in a boat preparatory to quartering there for the winter. Shortly afterward the ice made around us, and we banked up the vessel. At the time of Captain Hall's death we were banking up the vessel for winter-quarters. The awning was put on, and the banking was nearly completed when Captain Hall died. After we got into winter-quarters, and before the banking was completed, Captain Hall made a sledge journey toward Newman's Bay by the land. He started out to what I thought was the east, but he did not appear to be positive of it from the way he wanted the observatory set. He said he wanted it in just such a position, and then told me that he thought he would have to alter it, as he did not know exactly the points of the compass at that time; that he would have to test it before I opened some lights on the top for Mr. Bryan's transit-stand. He made the journey, and was gone a week. When he came back I had orders to make some wheels. I made three of them, and then I was ordered to discontinue them at the time of his death. The reason why I was ordered to make the wheels, was because Captain Hall encountered a great deal of bare ground, and he wanted to go over that when he could not use the sleds on account of there being no snow. He was calculating upon another journey right off, as soon as he recovered, before the season set in. I cannot tell the day he started; my log will tell, I think. He was gone something over a week, I believe. I saw him when he came back, and shook hands with him, and he appeared to be perfectly well. I saw him at the cabin door; I called to see him. I messed in the passage-way, and had my room forward. I never saw him after the first time, after his being taken sick, but twice. When he was very sick, I made an excuse to go into the cabin to see him; I had a piece of furniture to fix; I took that in, to see him then, and once after that Mr. Morton asked me to come in and open a keg of tamarinds. When I took that chair in to fix it, I had a little conversation with him; I asked him how he did, and he said that he thought he was getting along better; I had no other conversation with him; Mr. Chester was there with him at the time; there was nobody with him but Mr. Chester. The second time I saw him, was when I went in to open the box of tamarinds; I had not much conversation with him at that time; I only asked him how he did; he stated that he believed he was getting better; he was then in his easy chair, with a counterpane and cover wrapped around him, sitting up; both times he was sitting up; I never saw him again till after his death; I heard from him every day at the table. The steward and the cook both slept in the cabin, in the same place that he did; their births were opposite. I would hear statements about his health every day; I would ask if it would do him any harm if I were to call in; they said that they thought it was advisable not to disturb him. I asked Hans what he thought of his sickness, and Hans said that he travelled hard on the journey, and while they were building houses he did not do any work in the cold, and that did not do him any good. I saw him after he died; I saw Mr. Morton washing him before he was laid out, and then I made a coffin for him. Hays was the one who told me that the captain was dead. It was early in the morning when I was ordered to make his coffin; I made the coffin as quickly as I conveniently could, and he was afterwards put into it and buried on the shore.

After he died Captain Buddington took command. He stated that

he should go south; that he should return home. He stated that his orders were to return home as soon as convenient in case of an accident of that kind. I heard Mauch talking with Hays. He was something of an apothecary and chemist. He had studied chemistry, and I heard him and Hays in a discussion in the forecastle. He was telling Hays that the alcohol that they burned out on the trip had tartar-emetic in it, and that the fumes of it acted as poison when burned. He said he thought that that hurt Captain Hall, I do not know, however, whether there was anything in that or not. Hearing him speak of that, I asked him particularly then what he was talking about, and he told me the same thing. He told me he thought it had a great deal of effect on Captain Hall's health. We staid there during the winter. Nothing particularly was done, except carrying on the scientific observations and making ourselves comfortable. I was engaged in making sleds and mending furniture and working on the observatories, &c., always having enough to do to keep me in exercise.

Nothing special, however, was done during the winter. The scientific department carried on their operations regularly. Mr. Meyers and the doctor were very energetic, I believe, in taking their observations regularly; though I heard them laugh at the doctor about his getting lost in going over. They had a telegraphic wire afterwards run from the observatory to the ship. I do not know how he got lost. Some state that he was under the influence of liquor; but I cannot say that he was. I merely heard that; and I do not know as it is proper in me to mention it; for I must say that I never saw anybody that I know of under the influence of liquor, with the exception when they had nothing in the world to do, and those were very active energetic men. One of them was Mr. Chester. I do not think that liquor ever prevented him from doing his duty. I never saw anybody on board the ship so drunk that they could not do their duty. I never saw anybody under the influence of liquor when anything was to be done, that I know of. There might have been and I not have known it. When the spring opened, when the sun first arose, my first business was to go out and take a survey of the vessel and the way she lay. I found she lay very much cramped up. Her bows were on the tongue, on the berg. But what made that was a disaster that happened in the first winter; that is, she broke out in the winter. It was a terrible gale, and we were banked around at the time. The awning was down, and the first we knew the vessel was in motion. We had had ten or fifteen feet of snow banked around her, up to the rail, and the awnings over her. The first thing we knew, the vessel was in motion, and the bank disappeared from around it. There was no possible chance to find out what position we laid in, where we were going, or anything of the kind. There was no light; we only felt we were in motion and under cover, just like as if we were confined below, under the hatches, until Captain Buddington ordered me to cut up some junk and put kerosene on it and make some torches, which I did. After I got the torches made, and lighted them, and opened the port-hole, and stuck the torches out to give light, we could see the iceberg within grappling distance. Billy Lindeman volunteered to go on the berg. He was the man who acted as my mate part of the time. He volunteered to go out and make fast the lines. He cut his foot-holds with the hatchet, and made fast grappling ice-anchors to the berg; and in the morning, or at least as soon as the storm had cleared away, and we got the light of the snow, we saw around us and ascertained the position we were in. It was right on the tongue of the berg. We secured the ship there. We could have no

idea of our position until the spring opened. It was fortunate that we got where we did.

When the spring opened we found that the Polaris laid on her bow on a tongue of the berg, and the way she was constructed her rudder-post and stern-post were connected by an extension of the keel, forming a large space for the fan to play in. That was completely locked in with the ice. The shore ice was frozen in on that, and then the berg and pack from the outside forced it up against her, and was lifting her, and the shore ice was holding her down. The berg on the outside pack was forced in against her and there was ice set on the port side right on the port gangway, and that made her position very much cramped. As quick as it came light enough to see to do anything we had all hands turned to and cut a channel around under her counter, and on the starboard side to free her from the pack and from the berg. Still the shore ice that she was frozen into held her in the square where the propeller fan worked between the rudder-post and the stern-post. The condition of the ship was such that she broke on the line of the bottom of the keelson. She broke right through the planking so that it was from an inch and a half to two inches forward extending about eight feet, while there was nothing broken on the starboard side. When the tide was out we got a chance to work on it a little, before we sawed out. We finally got her released. When we started with her she leaked I think three hundred strokes to the hour. That would have been nothing provided we had had fuel enough. There was no impediment to our going. We could free the vessel with our hand pumps, but after that when we started south, when Mr. Chester and Captain Tyson's party came in from the boat journey I had to fix up their boats before they started after they came in. We had made this trial trip up to see if we could not meet them up above. We had not succeeded in doing that and sent for them. We returned to Polaris Bay and took them in. Then we proceeded south about the last of July somewhere I think, or the first of August. When we started south we went, I think, three or four days sometimes in open water. Then we struck into leads and went a considerable time in among the ice, making a good deal of progress. At last we got beset and made fast to the floe, no lead being open we laid there for a long time. This last time we were beset very severely. There was a very strong gale. When we got beset we commenced unloading. I was between the decks at the time. I knew it was pretty severe and believe that the Polaris received very serious damage at that time. I think a piece of her keel was torn off forward. I think this was done by the ice passing under her. She lost a part of her gripe. I do not think she lost any of her stem. There might have been a piece of the keel torn off below the gripe. The piece from the keel to the stem is what we call the gripe. I do not think there was a piece of the stem torn out below the six-foot mark. There was not to my knowledge, at all events, and I made several surveys of the vessel. I think in the first break out that there was a defect in her bottom somewhere. I think when they let go one of the anchors it must have struck the ice and she struck the anchor. If that was so it was on the port side. When we were beset we commenced throwing out everything. At first I was down below, and I got up on deck as soon as possible and went to work passing out the things to the men on the ice. Mr. Chester was receiving from Hayes and me and a sailor by the name of Gustavus. He was a Swede, I think. The greater part of everything was put overboard. They got all my clothing over, and I had nothing and depended on some old clothing that I found I had used up on the voyage.

When the last boat was lowered to some of the men who were on a floe, the vessel separated from the floe. When the vessel separated I had to be at the pumps because they had not gotten the fire up. We were very frugal of the coal and material for fire. We had been working the hand-pumps, but we found that she leaked a great deal more water than before, and we were very quick in getting the fires up. She laid nearly on her beam-ends when the ice slacked away from her. I suppose it was owing to the change of the floe piece and tide. After we did get up fire it was impossible in my mind to steam against the wind and tide, or attempt to reach the floe and the men on the floe. We drifted until morning. In the morning we looked for the men who were left on the ice, but could not see them. I had an idea, whether it was only imagination or not I do not know, but I thought I saw a large number of men on the piece of ice that was nearly like a berg, and a number sufficiently great to indicate that it was our party. I saw no provisions or anything else. They were near enough for me to take in the whole outline of them. It was late at night when we got in at anchor. They were on a piece of ice that was floating. It was moving with the current very rapidly. In the morning when day broke all hands made what little sail we could. The first thing we did was to get up fire. When I thought I saw these men on a piece of ice was in the evening just before dark. During the day we had looked after our comrades, but did not see them. This piece of ice that I saw them on seemed to be going in from Rensselaer Harbor to Littleton Island, in that stream that opened there a strong current. I do not know whether anybody else saw them or not. I mentioned seeing them to different parties, but they did not believe me. In fact I did not want to believe it myself. I thought it was imagination from the way it appeared. This was way up at Littleton Island. I have no reason to believe it was so, because we were lying then at Lifeboat Cove, and if it was them they must have been north of Littleton Island when we got in. They were some three or four miles I think north of where we were then at Lifeboat Cove, drifting as I thought when I saw them. If it had been them and they had no boats, they were in a very bad fix, and we had no boats at all—nothing but the vessel and the fuel all on shore, and we would have had no chance to get at them. It was just before dark of the same night when we went to anchor when I saw them. I reported this fact to Mr. Chester, I think. I do not think I spoke to any one else. I thought myself that it was more likely to be a mirage than a reality. It was from the deck that I saw them as I supposed. The piece of ice on which I supposed I saw them was not the kind of piece where we left them on. The piece we left them on was some miles in extent, with a house on it, and this very piece was a small berg not more than half an acre in extent, some 15 or 20 feet out of the water.

We had very hard work to steam into where we were, and when we got in we found ourselves aground. We built a house at Lifeboat Cove of the spars and bulk-heads of the ship, and we lived there during the winter. Our fuel lasted about half the winter in a small office-stove in the main house and the galley stove. After the fuel was gone, we got fuel from the ship. I made a survey of the ship when they began to get fuel off of her, and handed in a report of her condition to Captain Buddington. I could not tell what her condition was without the ice being cut out of her. She was filled with water, and frozen solid apparently. We commenced to build the boats just the first sun that came. We were only a few days in building the boats. We built three, and a small one we left with the Esquimaux. We started in the boats

that were constructed by Mr. Chester and the carpenter to go south somewhere about the 1st of June. After some twenty days' journey south, we were picked up by the Ravenscraig; we went to Lancaster Sound. We went from her on board the Arctic, and came to Dundee. Three of the party were put on board the Intrepid. As to the cold in Polaris Bay and down in Lifeboat Cove, we were not so late in the season, down at Lifeboat Cove, as we were at Polaris Bay. I went in bathing at Polaris Bay, and did not feel uncomfortable until about an hour afterward. There was a storm that came up, and after that it became quite chilly before I got on board again. But while I was in bathing, I did not feel very uncomfortable. I cannot be more particular in my account, unless I had my old log-book here, which I left at Lifeboat Cove. I suppose the log-book that the Tigress found when she went there is mine. That gives the days, dates, and particulars. Sometimes on this expedition I was a little out of my mind. One time I will mention, was a short time while in Polaris Bay.

Examination of Noah Hays.

I am about twenty-five years of age. I was born in 1844, in Henry County, Indiana. Before this, I had been a farmer. That is, I never had any profession. I joined the Polaris expedition, in Washington City, as an ordinary seaman. I rated as seaman, but was coal-passer in the fire-room during the voyage. I sailed from Washington with her, and, afterwards, from New York to New London; from thence to St. John's; from thence to Fiskernaes; from there to Holsteinberg; from thence to Disco; from thence to Upernavik, and thence to Tessiusak, and thence North.

Nothing of importance happened after we left St. John's, before we started north from Tessiusak. After we started to the north from Tessiusak, about the 15th of August, as near as I can remember, I was below a good deal, and did not know as much of what was going on as those did who were on deck. I presume no one knew less than I did. I had no chance to observe anything. Seven hours I was on duty to five off, while the vessel was under steam. The vessel was working along successfully up to the time she was beset, I believe, on the 29th of August. I did not go on deck at all to do any duty. I went from the fire-room to my meals and back. I had only two watches. It was determined that the vessel at the highest point that was reached was in latitude 82° 16′. This was when she was beset. She was thought to be higher at the time. I went on deck when she got beset and helped to land provisions on the floe. I saw land on both sides. There was nothing to be seen but ice in front and land on both sides. Ice was all around us. There was a broken pack on one side and a floe on the other. The broken pack was the floating ice and the other side was a solid floe. We made fast to the floe, and when the pressure of the ice was somewhat relieved, we took the provisions on board again, but did not succeed in getting the vessel any farther north. After drifting back perhaps two days, we ran into the harbor. We remained there until the 12th of August, 1872. We went into a bend in the coast there—a little cove behind a grounded iceberg, which Captain Hall called Thank God Harbor. Captain Hall went ashore, and formally took possession of his discovery there. We commenced landing provisions after we put the flag up. We anchored the ship, and began to make snug for the winter. We put up an

observatory on the shore as quickly as we could. We banked the ship as quickly as we had snow, and as soon as the ice would bear us up, and housed it over. It was nearly a month, I cannot remember the dates, before we had ice that we could walk ashore on. Captain Hall made a trip to the North on a sledge-journey. He started with a sled for the purpose of selecting a route to see if he could make an overland trip in the spring. He intended merely to prospect, as I understood him. Mr. Chester and the driver, Joe, accompanied him, I believe. I do not think Hans went with him when he first started. After they had gone a little distance they came back for another sled, and then I think Hans went along also. I believe they were gone two weeks. I do not remember anything very distinctly. I kept a sort of a journal, and all these things will be found written down there. During those two weeks nothing happened that I now recollect of any note. We were engaged in banking up the ship with snow. I saw Captain Hall when he came back, and met him at the observatory as he was returning. I asked him about his health, and I had it in my mind up to a little while ago that he said he had been unwell two or three days; but I found on inquiry among the rest of the crew that he told them no such thing, and therefore I must be mistaken about that. He looked very much exhausted to me. I walked back to the ship with him. He went around and spoke to those at work there, and shook hands with them, and went on board, and soon afterward I heard that he had laid down, complaining. After that I never saw him but two or three times until after his death. It was after we went into the cabin that I heard he was sick, but I recollect that he told me that he was unwell. He so appeared to me when I looked at him. I saw him afterward while he was sick two or three times. Only one time I remember of going into the cabin on purpose to see him, but he was in bed, and did not appear to want to talk much. He asked me how I was getting along, and when I told him he said he was glad to see me. I do not recollect what passed between us exactly. That was two or three days after he was first taken sick. He got home about 12 o'clock. We had our dinner at 3 o'clock. I do not know anything about his drinking a cup of coffee, only what I have heard lately. There was coffee on the galley. We always drank coffee for dinner, and we all took coffee shortly after he arrived. I think it was at dinner. It was a little before our dinner time, as well as I can remember, that we had something prepared aft to eat, when we were also called in. This was the coffee on the galley. I did not feel any bad effects from it, and I did not hear of anybody else that did. Once I went in to see him, and on two or three other occasions I saw him in bed. I do not remember of speaking to him only on one occasion. I just saw him lying there, the same as if he was in a kind of stupor like. I saw him the day before he died; he was lying still and breathing heavily in his bunk. After he died—he was buried on the 11th—I attended the funeral, and all hands were there. Services were read by Mr. Bryan. No one after his death took command formally. I saw Captain Buddington on deck two or three times afterward. He spoke to us in his usual amiable and good-natured style, asking us how we were getting along, &c. We were all engaged on deck at the time, sweeping and cleaning up a little, and feeding the dogs. He was always considered as commander after that. During the winter we had really nothing to do, only to stay about the ship and talk, and take exercise, and feed the dogs. The scientific observations went on during the winter regularly. In March, I believe, Dr. Bessels and Mr. Bryan went southward on a sledge journey. On the 1st of April Mr. Chester, with necessary help, com-

menced getting ready for a boat journey to the north, as soon as the ice should break away and admit of his starting. During this time there were hunting parties out among the men. I did not go on the boat expedition. Two boats went off on the expedition to the northward. One was commanded by Mr. Chester, and the other by Captain Tyson. Mr. Chester lost his boat the first day, but he soon returned and got another. They were absent from the ship about six weeks, I think. After they had been gone about a month we heard from them, and we tried to get up to where they were. Two men came from Mr. Chester's boat-crew, and told us where they were lying, what their prospects were, and what they wanted. They wanted some more provisions. When the two men came on board from Mr. Chester's party we made another effort to get up there with the ship, the Polaris, but were intercepted by the ice extending from shore to shore, and we could do nothing but to go a short distance above our place of anchorage. We put the men ashore with a small hand-sled, and two bags of bread and some sugar, and such things as that, that they could transport over mountains.

The point we reached the first time, with the ship, was the greatest northing that anybody ever made; that was about the last of August, 1871. We could not see any farther north at any time, because it was thick and foggy; if it had been clear we could only have seen from the deck about fifteen miles, or perhaps less; we could have seen nothing but the horizon, sky, or clouds. I never saw any chance to get any farther north than we did get; I don't suppose there was any chance, except with sledges, and certainly not a very good chance for sledge journeys; there was no land-floe to travel on.

About the 29th of November, I believe, during a heavy gale from the northeast, the ice broke away from us as far in-shore as where the ship was anchored. We commenced drifting away, and fortunately we brought her up against Providence Iceberg. When the gale abated, a day or two after that, where this open water had been left between us and shore, thin ice had frozen over it; we sawed out a place for the ship in that ice, and drew her off from the berg two or three fathoms, as near as I can remember, and also drew her ahead about twice her length, or a little less, leaving the anchor on the bottom, where it was dropped just before bringing against the berg. In a short time after that, there was another violent gale from the southeast; it was quite dark at the time, so we could not see much, but I am pretty positive as to how she happened to be nipped or jammed there. The heavy pack coming in against the berg crowded it farther in against the land, and it came upon the vessel; there was a spur of the iceberg that extended out under the water and it caught on her keel and raised her up. She broke down some of this thin ice, which was not more than 15 inches thick, perhaps—she broke that down two or three fathoms; when the berg stopped moving, she still lay on the spur of it, and was there all winter rising and falling with the tide; that would wrench her. Her stem was not displaced at that time, but was cracked; two or three boards were broken diagonally. The seam of the iron plates with which her prow was sheathed did not run parallel with the boards, and the boards just split diagonally, and opened a crack nearly an inch wide.

We worked three or four days and sawed the vessel out, and as quick as we got loose we made an attempt to steam up north, hoping to overtake the boats; finding we could not do that, we went back and waited till they came aboard. After they came aboard, we finally got out about the 12th August and began to move south. We got along very well for a few hours. When in the vicinity of Franklin Island, in latitude 80° 30′ or 80° 40′, we encountered the ice and were beset there.

The next day it slacked up a little, and we got a few miles farther down, and were again beset, and we tied up to a floe. We remained to that floe, drifting slowly down until the 15th October. We had built a canvas house on the floe, and put some provisions, a stove, and galley on it. On the night of the 15th of October the pack-ice on one side was drifting. The floe appeared to be turning round, which made it seem to us as if the wind was shifting. When it turned around so the wind turned toward the floe, it caught the pack on the other side, drove it away, and left open water there on one side of the ship. The floe kept turning, and in a short time it had turned around so that the wind was coming again over this water, and soon the pack-ice came down on her and nipped the ship severely, threatening to destroy her; but she raised out of the water and was keeled over toward the floe. We then commenced putting everything out on the ice. It was dark and snowing very hard, and blowing a gale then. It was about 9 or 10 o'clock in the evening when she was first nipped. So far as the most of us understood, we thought we should all have to abandon her. About midnight we got on the ice all we could use during that winter; the deck was cleared. We always kept an abundance on deck, in case of accident. After the work somewhat slackened, Captain Buddington gave orders to get everything back from the edge of the floe as quick as possible. We that had been working on deck were then going over the side to help, but the floe had been turning by the force of the wind, so that it left open water on the other side of the ship; and then the edge of the floe had been crushed by the ship coming up and falling down, and had left about 10 feet of ground-up ice between the ship and the floe to which she was tied, so that we could not get on the ice to assist those that were on it in moving the things back. While they were getting out another line and examining the ice-anchors, the ship suddenly broke away. I do not know whether one of the hawsers parted or not; I believe the forward one did. One of her anchors broke out of its place; we hauled that in with the stern line. We then drifted away, and I did not see anything more, as it was dark. We drifted away very quickly. The wind then began to abate. The ship was leaking badly, and, I thought, faster than she had been. We went right to the pumps, made a fire under the small boiler, and got hot water, and thawed out the large pumps on deck, and hastened the raising of the steam. During that time the little pump had been worked all the time for several days preceding, and as quick as we got the deck-pump thawed out so we could use it, we soon cleared her of water. Before that, it threatened to extinguish the fire before we could get up steam. After that we pumped with the small donkey-pump, and we went below and rested in our rooms. It was then getting light again; it was three or four o'clock in the morning. The first thing in the morning we commenced to take down the fore-sail to make coal-bags, knowing we would have to leave the ship. We could not use the pump on deck, as it was so cold, and we had neither force enough to use the pumps nor coal enough to make steam. So we fixed to leave the ship the first opportunity, whether to go on the ice or on shore. We had not force enough to man the deck-pumps and have reliefs.

When morning came I do not know that we looked for our comrades right away. I thought of them all the time, but our attention was drawn to the shore. We soon discovered that we were near Life Boat Cove—the captain and others knowing the position of Littleton Island, and hoped to get the vessel on shore there. I remember that I was that morning at the wheel, and there was a marine glass lying there. I took that, and scanned the horizon two or three times to the

southward, to Littleton Island, and to the shore until it brought the other shore within the field of the glass, but I could see nothing of our comrades. Others looked also. Mr. Chester was at the mast-head once or twice, I believe, but he was on deck most of the time. No one was at the mast-head continually. Henry Hobby was at the mast-head later in the day. He said he saw something on the ice, and came down and pointed it out to me. It was a great distance off. I could not tell whether it was a group of men, or what; I thought, though, that I saw something. But afterward the general opinion seemed to be that it was what they called black ice. There is no such thing in fact; but pieces of ice being reared up, it leaves a cavity that, when a long distance off, seems black. It is really a hole in the ice. We thought it might be that. That object was toward the western coast—diagonally across the channel, to the southwest. We could not have got to them, if what we saw had been our comrades. I should think that was fifteen miles from us; it was nearly as far as we could see anything from the deck—nearly to the horizon.

We finally got into land. About 4 o'clock in the evening, I think, we commenced to moor the vessel to the grounded hummocks ashore there. About twelve hours afterward, 4 o'clock in the morning, we commenced to work her in. Fortunately it was high tide when we got on the beach, and we were enabled to run her up so high that she would not sink, but when the tide fell, about 10 or 11 o'clock in the evening, she laid over on her side and took the ground. She would right up each high water and fall again at low water.

Next morning we commenced taking things ashore—timber, planks for a house, provisions, &c. We got everything from between decks as quickly as possible, so as to save all the coal we possibly could, and took everything we could, and let her fall with the water. She was tied well to the hummocks, but gradually through the winter she was crowded off. Every tide the water would come up between the crevices in the ice, and the ice would gradually swell a few inches. No amount of lines would have held her, and before spring the lines were all parted.

Two or three days before we left in the boats she had been blown out of her place, and was two or three times her length below, beating on the rocks, where I thought she would go to pieces, unless wind and high tide would happen to carry her out and sink her.

At this place we built a house and spent the winter. Mr. Bryan made a sledge journey from there to Renssalaer Harbor for the purpose of making some observations for time, and also one to Port Foulke, below there where Hayes had been. Dr. Bessels, I think, went to a glacier near to Port Foulke, known as My Brother John's Glacier, I think. He also attempted to go north. All I know about that is what he told me. He said he wanted to go north as far as possible, and was going to get a good team, drivers, and provisions, and get one of our men, Henry, to accompany him. He said he would make a confidant of me in regard to the enterprise of going up north. I don't think he ever got more than 15 or 20 miles from the vessel. He was gone about a day and a half. When he returned he told us he had crossed the channel and had been a little over a degree above the position of the house; but I don't think it was possible by any means. He never notified the captain of his intention. He told Captain Buddington he was going inland to examine a glacier. He returned and said the ice was in such a condition that he could not make the journey he proposed, and said he was forced to abandon the idea. That is the only sledge journey I know of, except those two by Mr. Bryan.

We commenced very early to make the boats, working a little along as the weather would permit. I believe we commenced taking the ceiling out of the cabin in March. Mr. Chester, Mr. Coffin, our carpenter, and one of the firemen, John Booth, worked at it exclusively. The rest of us did nothing with the boats, except get wood from the vessel and ice for water. They were working at the boats at favorable hours from about the 1st of April to the time we started.

We started to go south about the 1st of June with two boats. Captain Buddington commanded one and Mr. Chester the other. We were in those boats working south about three weeks, and got to about fifteen or twenty miles southeast of Cape York, where we discovered the whaler Ravenscraig fast to the ice. We were taken on board of her in a few hours after we first sighted her. She got out from the ice about the 1st of July; I do not remember the date exactly. We went in her across to Lancaster Sound. Fifty or one hundred miles up the sound we spoke the Arctic, from Dundee, and I and some others were put aboard of her. When the Arctic was full and ready to sail for home, we endeavored to get the rest of the crew on board, and spoke the Ravenscraig, and got those on board of her. We also signaled to the Intrepid, but she apparently did not see the signal. She was eight or ten miles eastward, and soon she commenced steaming in another direction. There was considerable ice between the Arctic and the Intrepid, and we could not get to her conveniently. Three of our comrades were left on board the Intrepid—Mr. Bryan, Mr. Booth, and Joseph Mauch. We arrived at Dundee, and finally came home in the City of Antwerp.

The discipline on board the Polaris was very good while Captain Hall lived. After he died I never noticed anything like disobedience, not in the slightest degree. I never heard any complaint made or any objections offered to the commander by any one when ordered to do anything. Still, I think—if you wish me to give any such thing as an opinion—I think it was lax. I think the men did what they were ordered to from principle, and not from necessity at all—not from what they considered necessity, by any means. I consider that, in that respect, we had excellent men.

As to hearing anybody, after Captain Hall's death, say that he was relieved at his death, I cannot remember the exact words; but one day I was over at the observatory with Dr. Bessels. I was there a good part of the time about that time in the winter. He appeared to be very light-hearted, and said that it was the best thing that could happen for the expedition; I think those were the words he used. I do not remember that I heard anybody else say anything of that kind.

Question. Did you ever have any reason to suppose that Captain Hall died anything but a natural death?

Answer. I do not know what it takes to constitute a reason. I never knew anything that would justify any such conclusion. As to what Dr. Bessels said at the observatory, I do not know that those are his words, but it was something to that effect. That was the impression on my mind. I know the next day he was laughing when he mentioned it. I was much hurt at the time, and told him I wished he would select somebody else as an auditor if he had any such thing to say. I was at that time over at the observatory rendering some assistance in the observations, but was not regularly detailed. I have seen Captain Buddington when I believed him to be intoxicated; not very frequently. I never saw him so that he could not do his duty; but I have seen him when I believed him to be under the influence of liquor.

The mean temperature of the winter at Polaris Bay was, I believe,

about 20° Fahrenheit below zero. Our minimum temperature, if I remember rightly, was 49°. But then there was some little difference of opinion. I think it was 49° when I observed it myself and recorded it; but I believe Mr. Meyer and others, who would be better authority, thought it was 53°. March was the coldest month. The temperature was not so low as we expected to find it, generally, but still I believe the temperature was lower there than any place south of there. At Lifeboat Cove the mean temperature was a little below that of Thank God Harbor, I believe. I have not looked over the observations so as to determine, but that is my opinion. The summer was not warmer at Thank God Harbor. I have observed closely one thing, and that is, I never passed a day in the arctic regions but what I have seen salt-water ice at some time during the day that had been made during that day. That freezes at a temperature of 28°. There was a large plain right abreast of where we were anchored, and the snow went off of that in June, I believe. The sun pouring right down incessantly on that twenty-four hours a day would cause warm air to come off of that occasionally, which would make the thermometer run up to 40° or 50°. Even then on the shady side there were places, when the sun got around toward the north some 5° or 10° below the horizon, it would be freezing at the top of the water on the shady side of the vessel. It is almost impossible to have thermometers properly protected in the summer time. There is always one part of the day when it is exposed, if not to the direct rays of the sun, to the current of warm air heated by the sun.

There was some vegetation up there—a little moss, several light plants, flowers of moderately brilliant colors, and a little grass. There is not much soil there, or there would have been more vegetation.

The character of the shore was rocky; I think it was limestone, but I know very little about geology. The beach was a shingle beach. The bottom was rocky, with stiff clay between the layers of rock.

There were musk-oxen, foxes, hares, lemings. I saw some wolf-tracks, but no wolves. There were one or two owls seen, too, and ducks and geese. I did not see any auks, but I believe they are there. They also had there what were called ivory-gulls, and another species of gulls that I do not know the name of, partridges, ptarmigan, snipes, and turnstones, and one or two kinds of plover.

At spring-tide once or twice we had as much of a rise and fall as 7 or 8 feet. It was generally about 6½ feet. At neap-tide it was from 1½ to 3 feet high, as the wind was favorable or unfavorable. The average would be about 4½ or 5 feet, I suppose.

[Diary produced.] That is my diary; it was kept by myself, in my my own handwriting. This one commences on the 15th of October. I kept one before that, but not regularly. I think that diary is here; I gave it to Mr. Chester at Dundee. My position and circumstances were such that I had but little chance to find out anything worthy of note; and the only wonder is that I had a chance to keep any diary at all. These diaries were kept by myself, day by day, as the events occurred, and they will give a more particular statement than I can recollect the details of now.

Question. Is there anything else, to which your attention has not been called or which is not set down in your diary, that you would like to say?

Answer. I am much obliged to you. There is nothing occurs to my mind now that has not been mentioned that I wish to say.

Walter Frederick Campbell examined.

I will be twenty-one years old next Christmas. I was born in Glasgow, Scotland. I have lived in this country seven years. I shipped on board the Polaris as fireman at Washington. I sailed on board that ship from Washington to New York, and from there to New London; from New London to St. John's; from St. John's to Fiskernaes; from Fiskernaes to Holsteinberg; thence to Disco; thence to Upernavik; thence to Tessiusak, and thence north.

Nothing of importance happened between the time we left Washington and the time we reached Tessinsak, the last point on the Greenland coast.

I was engaged principally in the fire-room below, and had not so much chance for observation as those on deck. After we left Tessiusak, we proceeded north for some distance, then crossed over to the west coast, and then skirted up the west coast to the north. We stopped once, and Captain Hall went ashore to see if he could find a place for a depot for provisions, for winter-quarters, if we should find it necessary to come in there. After that we went up through Smith's Sound, through Kennedy's Channel; sailed past Cape Constitution on the right, through what was formerly called Kane's Open Polar Sea, and found it to have land on both sides. We found quite a wide expanse of water between Lady Franklin's Bay and the inlet afterwards called the Southern Fiord; which expanse, after Captain Hall's death, we called Hall's Basin.

We found an opening still to the north above Lady Franklin's Bay, consisting of a channel about twenty-five or thirty miles wide, with land visible on both sides, which Captain Hall called Robeson Channel. We went up this channel until we reached our highest point, in what Captain Hall called 82° 26′ north latitude, but which was afterward found by observation to be 82° 16′. We were up in this channel two or three days. At one time Captain Hall tried to make a harbor on the east coast, at a place which he afterward called Repulse Harbor. Afterward in trying to get across to the west coast we got beset in the ice. I don't recollect how many days we were beset there. We put provisions out on the ice, and kept shifting them about, taking them on board and putting them on the ice again, as the danger appeared to be more or less imminent. Afterward, with wind from the northeast, we drifted for two days farther south, when the ice slackened, and we made in to the east shore in a small cove in the lee of a stranded iceberg, which Captain Hall called Providence Iceberg, calling the harbor Thank God Harbor. We lay there about three days, and when the ice got thick enough we got provisions ashore. We then made the ship fast to the berg, and some time after Captain Hall's death we broke out with a northeast gale. That night we got our ice anchors fast again, and that was our rescue. After we got fairly into winter quarters Captain Hall made a sledge-journey to the north, and was gone somewhere about two or three weeks. On his return from the sledge-journey I was the first man that met him. I met him above the observatory, on shore. I asked him if he was fatigued after his journey. He said "no, he was pretty tired, but quite well in health," and came to the ship and made a hearty greeting to us all. I walked down to the ship with him. He looked tired, and that is just the reason I asked the question if he was fatigued. He looked tired and worn out. He said he was a little tired, but in good health. He shook hands with all the men, who were at that time banking up the ship, and afterward welcomed us into the cabin. I

was second steward that winter. I was helping John Herron, who was steward. Captain Hall came into the upper cabin. I went down into the under cabin. I heard the captain ask the steward if he had any coffee ready, at least the steward first asked him if he would like to have a little coffee, and he said if all hands would have coffee he would be glad to join them. I really forget whether they did have coffee or not, but I believe Captain Hall and all hands did; indeed I am quite sure they did; and afterward, that night, he took sick. The steward got the coffee from the galley. It was made purposely for the captain. I could not say whether all hands had coffee or not, but several of them had, I know. I didn't see the steward get it from the cook, and I didn't see the coffee prepared. The coffee was had in the upper cabin and in the lower cabin. It was taken up into the upper cabin in a kettle, and afterward the same coffee was taken down to the lower cabin in the same kettle. I think it was the steward carried it. Afterward I had to wash up the dishes, and then I went forward and retired. I lived forward. I don't think all in the cabin did have coffee, but I am not sure, and didn't pay much attention to it, but I know several of them did have coffee, for I washed the dishes. Some of the men were playing chess, some sewing, some washing, some reading and talking. Noah Hayes plays chess, and Mr. Coffin, the carpenter, and I believe Kruger, and there was checkers, too. The next morning after Captain Hall's return was the first I heard of him being sick. I didn't hear of it until next morning because I went to bed as soon as I got my work done. I saw his face and head several times during his sickness, but didn't speak to him. It was my duty to go into the cabin in the morning and sweep it out. Mr. Schumann, the engineer, the doctor, Mr. Bryan, and Mr. Meyer lived in the cabin, and there was John Herron and the cook in the upper cabin. I believe that was all at that time because the berth above Captain Hall was not occupied. I never spoke to the captain again, and only saw him occasionally during his sickness when I went into the cabin to sweep it out. I know nothing about the captain's sickness only as I have heard the talking among the men. Some said that he had had a sun-stroke some years before he went up there, and it had affected him on his sledge-journey. Another thing I heard was that some of the men asked Dr. Bessels what he thought, and the doctor told them that he would never get over it. This was when he was first sick. I am not quite sure what man said that, but I believe it was Herman Simmons, if I am not mistaken. After the captain died he was buried on shore.

Question. Did you ever have any reason to think that he died anything but a natural death?

Answer. Well, sir, I have got no idea about it at all, and I could not have anything to say on the subject. I don't know of anything that would lead me to any other belief than that he died a natural death. I do not know anything that would give me ground to suppose that he died anything but a natural death. After Captain Hall's death the first report that I heard was that Dr. Bessels was to have command of the ship. Then I heard that Captain Hall had turned the ship over to Captain Buddington. Three or four weeks after the captain died John Herron didn't have so much to do, as everything was cleaned up for the winter, and then I had to work after that in the engine-room all winter. Nothing happened of importance after that except the blow which broke us out from our anchorage and drifted us out against the berg. The ship rested on the heel of the berg during the whole winter, rising and falling with the tide. Every tide she would rise, and when it went

down she would just lay right over. The scientific operations went on all winter. When spring came Mr. Chester and Mr. Tyson made two boats ready. They were about a month in preparing to go north. Mr. Bryan and Dr. Bessels had been on a sledge expedition toward the south That was before the boats went. The boats were gone, I believe, exactly a month, and while they were gone we sawed the ship out. While they were gone we made three attempts to get north; but were not able to do it on account of the ice being so thick in the straits. The ship was then making a great deal of water and we were obliged to pump her regularly. I was attending to the donkey-pump, and kept it going about twenty or twenty-five minutes out of the hour sometimes. She didn't seem to leak so much afterward. She kind of filled up with sand after we returned from the north and got back to winter-quarters; the sand and clay together entered the crack and stopped it up.

Finally, on the 12th of August we started southward. We steamed along until we entered into Smith's Sound, where we got beset in the ice again and drifted farther south. Sometimes we would see a little crack of open water. There was open water in toward the west shore, all the time. That looks as if, could we have got there, we could have got down. We finally tied fast to a floe, and floated on it two months or more. We built a house on that floe; put some provisions on it and staid there till the night of the 15th of October. At that time I was below and I felt a kind of motion in the ship that I thought kind of curious, and I came up on deck. Just then the crack was opened, and I went down to report to the chief engineer. On going down I met him in the engine-room and he sent me down to steady up the boiler and keep it from falling; and after we had steadied it up we ran afoul of this berg and the ship canted and went over; and it was as much as we could do to get back out of the engine-room; but we did get back in time to assist in getting the provisions over. The plates in the fire-room lifted it and there was great difficulty in getting over; but we finally got out. We assisted in getting the provisions out. Afterward there were men—I can't say who, sent on the ice to pick up the provisions on the edge of the floe and take them to the house. There were several, and I believe Henry Hobby was one, standing on the gangway. The ice was shifting around about the provisions and Mr. Chester sent me to the pumps to pump by hand; and after that I couldn't see much of the proceedings. We were getting all the stuff out of the cabin and putting it over the side. The ship seemed to make water rapidly after that and the water gained so fast that it was as much as I could do to get steam on. It was very dark and it was blowing and there was a heavy snow-drift. Her moorings did not hold her, and she drifted off in the gale to the northeast, or somewhere about that direction. After we got adrift we had hard work to keep her afloat; at such times as we gained on the water, we got her clear. All hands worked at the deck pumps till we got fires under the boilers. They were working at both deck pumps to keep the water out of the fires, and finally succeeded in getting up steam, and we then pumped by steam.

Next morning we were surprised to find ourselves near Life-Boat Cove; the storm had then moderated considerably and cleared up. As soon as it came daylight we made fast to some little pieces of hummock. As soon as it was light enough Mr. Chester went aloft to the masthead to see if he could get any tokens of the party that broke adrift from us. He could see provisions, but no boats or human beings. In fact, I went up myself, in a little space of time, and I could see nothing but a few boxes and stuff on a piece of ice. I know I saw some provisions on a

piece of ice, but I could see no tokens of any human beings. I believe it was about 10 o'clock in the morning when I went up to the masthead; the weather had cleared up, and it was a very nice day and quite calm. We worked very hard that day trying to get the ship to the beach; she was making water all the time, and we had to keep the pumps going most of the time. We could have got up sufficient steam to work the pumps, but our fuel was scarce and we were looking out for that. We wanted to save all the coal we could. We kept up just enough steam to keep her dry, and I believe it took us about three days to get all the stuff off and to let her fill in. We landed them, and Mr. Chester erected a house on shore. The Esquimaux from the nearest settlement came the second day after we got there to visit us. They helped us land the provisions, and one family from the west side staid with us all winter.

Dr. Bessels and Mr. Bryan were at work all winter at their scientific operations. Dr. Bessels made one or two attempts to go North in the spring, and made another sledge journey to the South. Mr. Bryan also went North to Rensselaer Harbor.

When spring came we built two boats, commencing about the 1st of April. On the 3d of June we started south. We were on the boats about twenty-one days. When we got about fifteen or twenty miles south of Cape York we were picked up by the whaler Ravenscraig, and went with her to Lancaster Sound, then we were transferred to the Arctic, and went with her to Dundee, and came thence to the United States.

I did not keep any diary while the vessel was under way, my duties kept me below, so that I did not have much chance for observation.

Q. Is there anything that you can think of and wish to say to which your attention has not been called?

A. No, sir; I do not think of anything.

Q. How was the discipline on board the ship while Captain Hall lived?

A. Everything was orderly, as far as I knew. I tried to do my duty, and everybody else did the same; in fact I did more than my duty, I did all I could.

We had a cat on board that we took with us from Washington. A little soldier boy had it on board the Polaris at the Washington Navy yard before we sailed and he gave it to me. We took the cat with us, and he staid with us both winters in the ship, and finally ran away from us at Hakluyt Island as we came down in our boats this last spring. The Esquimaux at Life-Boat Cove had never seen a cat before and were very much interested in it. They gave it the name we called it by, "Tommy." They have a name for it in the Esquimaux language, though they have not the animal itself. I do not know the name.

WASHINGTON, D. C.,
December 24, 1873.

At 12 o'clock m. Hon. George M. Robeson, Secretary of the Navy, Admiral Reynolds, Professor S. F. Baird, and Captain Howgate of the Signal Service, assembled at the Navy Department for the purpose of taking the statements of the last three of the survivors rescued from the steamer Polaris, and who arrived in New York on the 6th day of November, 1873.

Examination of Richard W. D. Bryan.

I was born in 1849 in the State of New York, and am twenty-four years of age. My last place of residence was Westchester, Pa. I joined the Polaris expedition as astronomer. I joined the Polaris up at Disco Island, in the harbor of Godhavn. I went out in the Congress. I could not tell you exactly the date I got on board the Polaris, but I think it was the 13th or 14th of August. We left Disco on the 17th of August, I think, and ran up the coast, keeping within sight of it all the time and stopped at Upernavik. We stopped there for a couple of days. Then we left there and touched at a little place that they called Kingituk. We merely sent a boat ashore there. We did not anchor the vessel, but only staid there about an hour. We then proceeded up to a place called Tessiusak, the last Danish settlement. We remained there until the 24th of August. On the afternoon of the 24th we started again, and kept along the coast until we came to the entrance of Melville Bay. Then we struck a course for Cape York, which we sighted the next day, I think. After passing Cape York we kept up along the coast, passing between Wolstenholm and Saunders's Islands. We were then compelled to keep more to the westward on account of the ice, and went on the outside of Hakluyt Island. Then we were enabled to go more to the eastward. We kept quite close to the east cost when we passed Cape Alexander. When we got up to Cairn Point, however, we were driven over to the westward to find an opening through Smith's Sound. Then we took very nearly a straight course for Cape Frazer, at the entrance of Kennedy Channel. I cannot remember the date that we arrived opposite that, but at any rate we stopped there, and Captain Hall went on shore to look at a bay there, and to see whether it would answer for a harbor in case the vessel should be stopped by ice. It was on the western shore of Kennedy Channel. He came back and said the bay was too shallow to anchor the vessel in. Then we ran up quite close to the west coast of Kennedy channel. We were first stopped by ice on the 29th of August, I think, when we got our latitude. That was the only latitude, I think, that we got after passing Cape York. The latitude was 81° 20′. We only remained there part of that day. In the evening we started up Robeson Channel, and gained our highest latitude on the 31st of August. Then after we gained our highest latitude it was decided that we could get no farther north—at any rate, on that side of the coast, and it was decided to try to go to the other side to find a lead up along that side; and if we were not able to do that, then we intended to return. At that time we were quite close to the east side, when we gained our highest northern latitude much closer to the east side than to the west side. It was found that we could not get any farther on that side, and then it was decided to endeavor to penetrate the ice and get to the west side if possible, we supposing that we might find a lead there that would carry us north. We endeavored to do that, and in doing that we got beset.

I think it was about noon that we reached the highest latitude. We tried to get over toward the western coast, but on our way over we got beset; it was decided we could not get up any farther on the east side by those who had charge of the vessel. I did not know much about it myself. I did not go off the deck at that time. About 12 o'clock there was a consultation called as to what course should be pursued. I believe that the consultation was called because Captain Buddington had told Captain Hall that they had gone as far as they could. I was not present at that consultation, and they did not ask my advice in regard to the matter. I learned afterward that the result of the consultation was that they

would endeavor to get to the west side in order to find a passage. It was determined that if they did not succeed in getting a channel up along the west side, then they would return to the east side, and run into a harbor that had been seen on that side. It was in trying to go across that we got beset. While we were up there at that highest point, we were all the time looking out. A good part of the time it was very foggy, and it was snowing. There were drifting snow and snow-squalls, so that it was only at times that we could see the land. For a short time, however, we had very clear weather, and then I could see the land on the east side, which seemed to end in a point. I saw, also, the land on the west side. The land on the east side I followed up a short distance with my eye, with the aid of a glass from the deck. I did not go up aloft. Far ahead we saw what the sailors call a water-sky. A good many thought it was land. I could not see any indications of there being land there. All around us was very heavy ice, and it was moving very rapidly down the channel, and, as I say, there was what the sailors call a water-sky. Right around the vessel there was quite a space between the different floes, so that I was, personally, very much provoked that they did not go up farther; but I have since learned that a person from the deck of a vessel cannot form a very good judgment in regard to ice. I learned this from experience that I had on board the whalers. On board the whalers I looked at the ice from the deck, and then went up to the mast-head and looked at it through glasses, and I found that a person could not form a correct judgment at all from the deck. It looked to me at the time, however, as if they might have gone on. I suppose, even now, that they could have gone on for, perhaps, half a mile, but I am very well satisfied that they could not have gone any farther. As I remarked, however, I was at that time of a different opinion.

As I stated, we got beset in the ice and drifted down. We drifted for I think a little over three days. On the 4th the ice opened somewhat, and we got a chance to get the vessel out. We steamed right into the east coast, and dropped anchor there. It was on the midnight of the 4th that Captain Hall went on shore for the first time. This place where we anchored could hardly be called a bay. It was part of a large bay that is formed there that Captain Hall afterwards named Polaris Bay. The particular place where we dropped our anchor could not be called a bay, however, nor was there any particular harbor there, but it was out of the current because it was under the lee of the cape, at the entrance to Robeson Channel, which Captain Hall called Cape Lupton. The current for this reason swept the ice clear of us, and at the same time we were on the inside of a large iceberg, which it was thought would protect us from the pack coming up before the southwest wind. Captain Hall went ashore there the first night at midnight. I think he there unrolled the stars and stripes; at any rate, he told me when he got back that he had taken possession of the land in the name of the United States. He said he went there for that purpose.

It was decided to remain there, and to make our winter quarters there. We then commenced work, landing our stores and provisions on the shore, and otherwise to prepare for winter. We also put up an observatory. Everybody was engaged in doing something. I cannot tell exactly what day, but later, a sledge party was started out by Captain Hall, which consisted of Mr. Chester, the first mate, Dr. Bessels, and two Esquimaux. They were sent out to try to find some musk-cattle, traces of which had been seen by the Esquimaux, and also for the purpose of ascertaining whether there was a feasible overland journey to the north.

They were gone six or seven days, and brought back one musk-ox. On the 10th of October, I think it was, Captain Hall himself started on a sledge journey with Mr. Chester and the two Esquimaux. On the 24th of October I think he returned. He was gone at any rate two weeks. During his absence the observatory was put up, and the ship arranged for winter quarters. Part of the awning was placed over the vessel, and the vessel banked a little with snow. Observations were commenced. There was some little surveying done. I cannot now think of anything else.

Captain Hall found a bay which he called Newman's Bay, after the Rev. Dr. Newman, and followed that out to where it empties into Robeson Channel, and called the two headlands—the one to the south Summer Headland, and the one to the north Cape Brevoort. This was but little above latitude 82°, I believe. This was the farthest point Captain Hall reached.

Captain Hall crossed the bay, and had one of his encampments right under Cape Brevoort. Then, finding that he could not continue further with his sledge upon the ice, he took a walk one day over the hills. I do not know how far he went, but the copy of his journal, in which I presume that was noted, was brought down, I believe. He came back and reached the ship on the 24th of October, and was at once taken sick. He remained ill for two weeks; conscious part of the time, apparently, but most of the time quite delirious. On the 8th of November he died. I saw him when he came back. I was on the deck of the vessel. I saw him on the ice coming up with the sledges, and then I spoke to him. I do not remember whether I went over on the side of the vessel to speak to him, or waited until he came on board; but I remember that I spoke to him at the time, and remarked that he was looking very well. I think he said as usual, "I am very well, I thank you," or something of the kind. I did not notice anything particular about his remarks. He did not say he was not well, but Mr. Chester told me that he thought something was the matter with him on his sledge journey, that he was not quite as active as he would expect him to be. Captain Hall mentioned this fact to Mr. Chester, that he was more inclined to ride on sledges than usual, and he mentioned the fact to Mr. Chester as something unusual; that ordinarily he was able to run along with the sledges without riding on them, except once in a while; but he was compelled to ride on this journey more than was customary with him. Mr. Chester told me that during Captain Hall's sickness, I think. I will not, however, be positive about that. It is a long time ago, and it might have been either during his sickness or after his death that he told me.

I lived in the lower forward berth on the port-side. I lived in the same cabin with Captain Hall; but there are two berths, one above the other; I lived in the lower forward one on the port-side, as I have stated. Captain Hall at that time was sleeping in the lower after-berth on the starboard-side in the cabin. He had removed from his little room, and fitted that up for a galley. I saw him and shook hands with him when he came on board the ship, and in a very few minutes, I think, I followed him right into the cabin. I remember Mr. Morton was seeing about getting his wet boots off, and I remember his drinking a cup of coffee. Then he got up to change his shirt, and he said, "I feel sick," or "something is the matter with me," or something of that kind. He made some such remark as that he was very weak. Then Mr. Morton and some one else assisted him into bed in his berth. I did not think he was very sick, not at the time. I thought it was just probable that he had over-exerted himself. I did not think he was at all sick then. It was

a very few minutes after he got into the cabin. He had just stepped on deck and spoke to a few of us, and then walked right into the cabin.

Question. Was this within half an hour of his coming into the cabin or coming on board the vessel?

Answer. Yes; I think it would be safe to say it was within that time.

Question. Did he then take the coffee?

Answer. Yes; I think I saw him take the coffee, and almost immediately afterward——

Question. Within five minutes afterward?

Answer. I do not know about that, because he might have given the cup back, and he might have spoken a little while, and my attention being turned off to something else, I could not see whether he took it or not; but I associated the two facts in my mind, that just as soon as he took the coffee he complained of feeling sick and went to bed. It might have been more or less of an interval; I could not tell you exactly how long.

Question. When you say you thought he had over-exerted himself, did he seem to be weak? Is that the idea you wish to convey?

Answer. Yes; he seemed to have something the matter with his head I thought. That is what I thought when he was first taken, and I have an indistinct remembrance that he threw up after he got to bed; but I won't be quite positive about that. I thought he was just fainting, or dizzy, or something of that kind.

Question. The impression made upon you by his conduct then was, that he had something the matter with his head, or was rather faint and dizzy?

Answer. Yes; that was my idea at the time. I think that shortly after that he threw up. It just occurred to me now; I never thought about it before.

Question. Who brought in the coffee

Answer. I think it was the steward. I could not tell you where it was brought from. I have no doubt that the steward brought it.

Question. Did you take any of that same coffee?

Answer. Not at that time. I might have done so previously or subsequently. I do not know positively about that, but I did not take any coffee at that time.

Question. Do you know whether the coffee was brought in the same identical coffee-pot that was used in the galley?

Answer. No; I do not know anything about that. I had no chance of knowing. I did not go to the galley to find out, and I only saw the steward enter the cabin with a cup of coffee and go out with an empty cup.

Question. Did anything occur to you as a matter of any interest?

Answer. No, sir.

Question. What happened after he went to bed?

Answer. I cannot give you the events in the order in which they occurred. I kept a journal. I just remember that Captain Hall was very delirious at times, and at other times quite rational. That is, he seemed to talk very reasonably about his plans for the future and about himself; but the most of the time he was out of his head. I saw him every day. I slept with him; that is, I slept in the same room with him.

Question. Who took care of him during his sickness?

Answer. There were several. Mr. Morton and Mr. Chester seemed to take the task on themselves more than any one else. During the daytime several of us would stay with him, but during the night Mr. Morton and Mr. Chester were with him. These are the only two that I remem-

ber as having set up with him at night. I know of several who offered to, but Mr. Chester and Mr. Morton seemed to take it on themselves.

Question. After you went to bed the first time, did you see anything of him before the next morning? Did you hear anything more about his being sick?

Answer. I could not tell you that. I do not know when I first got the idea that he was really sick. I never supposed he was so sick that he would die until he did die, although Dr. Bessels used to say that if he had another attack he would die. I remember hearing Dr. Bessels saying that, but then I did not believe it.

Question. Who attended him? Did he take any medicine?

Answer. I do not know what medicine he took; however, I remember the doctor once gave him a mustard-bath. He bathed his feet in mustard-water, and then he used to give him hypodermic injections. I know that the doctor at one time wanted to administer a dose of quinine and the captain would not take it. The doctor came to me and wanted me to persuade Captain Hall to take it. I did so, and I saw him prepare the medicine. He had little white crystals, and he heated them in a little glass bowl; heated the water, apparently to dissolve the crystals. That is all I know about any medicine. I only knew that, because I had persuaded Captain Hall to take the injections. It was given in the form of an injection under the skin in his leg. I believe he gave him medicine at other times, but that was the only time I had any knowledge of it.

Question. Did you have any difficulty in persuading the captain to take it?

Answer. No, not very much.

Question. Why did he object?

Answer. He did not like the doctor very much at that time, and he was a little delirious, I think. He thought the doctor was trying to poison him.

Question. Did he ever tell the doctor so?

Answer. O, yes, repeatedly; but then the doctor was not the only person that he accused of murdering him. He is the only one, however, he ever accused of *poisoning* him. He accused nearly all the officers of the vessel at one time or another of trying to murder him, I believe; I have no idea, however, that he was in his right mind when he made those accusations; I did not think so then, and I do not think so now.

Question. Did he ever accuse you?

Answer. No, sir; I do not think he ever accused me, but he did nearly all. I do not remember of his ever accusing me.

Question. How was it about Mauch?

Answer. He had a good deal of confidence in Mauch, but Mauch was not with him very much in his sickness.

Question. Did he ever accuse Joe or Hannah to any one?

Answer. No; I think not. He lingered for two weeks, I think. I think he was taken sick on the 24th of October, and died on the 8th of November. He was better some of the time; he then appeared to be quite rational indeed, and he spoke very well. He had Mauch in the cabin one day, and he was looking over some records of his sledge-journeys, trying to get them fixed up, and discussing his plans for another sledge-journey.

Question. Did he appear to have any misgivings at any time that he would not recover? Did he ever refer to the probability of his not getting well?

Answer. When he was rational?

Question. Yes.

Answer. No, sir; I spoke to him about it once, and told him he might not get well, but he did not seem to think that there was any immediate danger. That was when he was nearest in his right mind. It was pretty difficult to tell when he was in his right mind and when he was not, because sometimes he would get off something very rational, and then he would come out with something that did not sound so well.

Question. Is it your idea then that for almost all the time after he was first taken sick until he died his mind was unsettled?

Answer. Yes, I think so. Occasionally he would appear to be nearly rational, but then he would break out again into saying strange things.

Question. He accused almost everybody, you say, of wanting to murder him. Do you remember any particular instance?

Answer. It is pretty difficult for me to distinguish between what I remember from my own observation and what I remember from hearing others talk, because we have spoken about all these things so much. I think I was in the cabin at the time he accused the cook of having a gun that he was pointing at him from his berth. And then he used to frequently remark to me that the doctor had some infernal-machine there in the berth that emitted some blue vapor. He said he could see the blue vapor coiling all around in the atmosphere, and hanging alongside the edge of the berth; and he would call my attention to it, and ask me if I did not see it. He would say, "Now, it is there crawling along your nose." He said that the doctor had put that machine somewhere, and that he was pumping this blue vapor into his berth, and it was killing him. Then I have a faint recollection that I was in the cabin when he was complaining about a conspiracy that had been formed by the officers. I think he was complaining to Captain Burddington at that time. He thought that Captain Buddington, Mr. Chester, Mr. Morton, (I do not know certainly about Mr. Morton,) and Captain Tyson had joined together to kill him; but that, I suppose, was just his wanderings.

Question. Did Captain Hall exhibit any symptoms of paralysis, as far as you could judge?

Answer. I heard he was paralyzed all on one side, but I never noticed anything of the kind.

Question. Did you discover any difficulty in his articulating distinctly, or in swallowing at any time?

Answer. I never noticed anything of the kind. I did not have much to do with him when he was eating. He was very particular about his eating. For a long time he kept his food under his own charge, and got Mr. Morton to administer it to him. His food he kept locked up under his berth, and took the key to bed with him.

Question. Do you know what he did eat?

Answer. He had crackers, and I think they made him some kind of gruel, or arrow-root, or something of that kind. And then he had in his drawer a bottle of wine, and, I think, a little preserves; but finally, I believe, he intrusted the care of it to Hannah, so that Hannah was the only one who administered any food to him; but I never heard at the time, that I remember of, that there was any inability to swallow on his part.

Question. Do you remember when he died?

Answer. I remember the night he died.

Question. Where were you?

Answer. I was asleep. There was no one up but Mr. Morton. I was called up.

Question. Had he had a second attack just before he died?

Answer. I do not know. I did not understand these attacks at all.

The night before he died, as he went to bed, he appeared very rational indeed. I remember this very distinctly. I was there at the time, and the doctor was putting him to bed. The doctor had gotten him into bed, and was tucking his clothes around him, when the captain said to the doctor, "Doctor, you have been very kind to me, and I am obliged to you." I noticed that particularly, because it was a little different from what he had been saying to the doctor. I think these were the last words that he uttered, because that was just as he was fixed for the night, and then he turned over and went to sleep. Mr. Morton told me that all the evidence that he had that he was dead, was a cessation of breathing. He said that just before he died he had heard him with his regular breathing, and then all of a sudden his breathing ceased, and then it commenced again. I think he said it ceased twice, and then altogether, and then he woke us all up.

Question. Did you notice his breathing at all when he was sick; was it loud breathing?

Answer. I noticed that it was a little louder than usual; a little stronger than a person ordinarily breathes. After he died they prepared him for burial, though I was not present at the time. I did not see him until after he was laid out in the coffin; that is, I did not see the preparation. I just remember of going into the cabin and seeing the coffin on two chairs with Captain Hall's body in it. I believe the carpenter made the coffin. I think he was buried on the 11th. I read the service. I did not read all the burial service; I just read portions of Scripture and offered a prayer. It was what we call the day-time, though it was quite dark. There was, however, considerable twilight. That particular day the sky was very cloudy, and you could only see the glimmering of the twilight through the breaks in the clouds. They were heavy clouds—heavy water-clouds.

Question. After Captain Hall's death and burial, who took command of the expedition?

Answer. At first there was not very much of a change. Whenever there was anything to do, Captain Buddington always had it done. There was not very much for the crew to do, except to clean off decks, and sometimes to go ashore and get some provisions. Captain Buddington would always tell the first mate to have such things done, so that there was not much necessity for any exercise of command. Whenever the crew had a complaint to make, they always came to Captain Buddington and made it, and he tried to have the thing fixed up. I believe Dr. Bessels got up a paper that he called the first consultation between himself and Captain Buddington, which he signed, and I believe Captain Buddington also signed. I do not know exactly at what time that occurred, but the paper did not amount to anything, except the statement in it that they both proposed to do their duty. That is all.

Question. Then Captain Buddington went into command upon the death of Captain Hall?

Answer. Certainly. We all recognized him as commander. He did not get up and say he assumed the command and direction of affairs. There was no formal announcement, but he took command as a matter of course, just as a lieutenant of a company would take command upon the death of the captain, or the mate of a vessel take command if the captain was shot. There was, however, a good deal of talk at first about there being a joint commander, on account of the instructions of Captain Hall. Some contended that it was intended that Dr. Bessels should be joint commander with Captain Buddington. But Captain Hall had left no written instructions to that effect, and, of course, that was

no argument at all. Still, that proposition was advanced by some, but only by a few. We continued along in that way. The crew did not have much to do. Observations, however, were kept up. The first thing that disturbed our winter life was a very severe gale on the 21st of November. That was a very strong gale from the northeast. After the gale had blown some time, we heard water dash up against the side of the vessel, and then we knew that we were adrift. We were very much afraid then that we would be driven out into the pack. The cable was played out so as to let the ship swing to her anchor; but after a short time they began to see that the anchor did not take any more cable, and yet the vessel was broadside to the wind. At first they did not know how to explain the phenomenon, but they looked on the lee-side of the vessel and found the vessel was lying right up against the iceberg, and that the iceberg held it from going with the wind. Then they sent two or three men out.

Question. Was this in the night time?

Answer. It might just as well have been night, for we could not see anything. Besides, we had awnings all over the vessel. It was so dark we could not see very much. The men went out on the iceberg and we lighted them up by putting tarred rope in a pan with kerosene oil and setting fire to it. They went outside, and put two or three anchors in the berg, and in that way the ship held fast until the gale blew over. In a couple of days ice was formed around the ship again, and then the ship was drawn off from the berg about 50 feet and about 100 feet farther on, so as to get it more fully under the line of the berg. We continued that way quietly for a few days, when, on the 28th, we had a very strong gale from the southwest, just the other point of the compass, and that gale had the effect of driving the berg, although it was aground, over this 50 feet right up against the vessel and pressing the vessel against the ice on the other side. But this ice happened to be young ice that had been formed since the northeast gale, and it broke, the consequence of which was that it saved the vessel. If that had not broken, of course the vessel would have been crushed. When this berg came in, there was a tongue run under the bow of the vessel. I do not know whether at that time it split the stem, or afterwards; but the result was that the stem was broken. It not only ran this tongue under the vessel, but behind the vessel and on the outside of the berg, it piled the ice up very high, the young ice being broken by the pack on the outside coming in. It piled the ice up so that we could stand on the quarter deck and step over on to the ice. After that gale was over, some few efforts were made to try to get the vessel clear, but we could not get the vessel forward on account of the vessel resting on this tongue of ice. The only way to move the vessel would have been to run her back, and that could not be done on account of this pile of hummocks that was at the stern of the vessel. It would have taken a great deal of time to have got these away if it had been possible to get them away at all with the force we had. Several efforts were made to blow the ice up around with gunpowder, but they proved ineffectual, and it was decided that the only thing we could do was to allow the vessel to remain there, which we did. She remained there all winter. On account of being tilted up against the berg, and the berg remaining aground, and the ice rising and falling with the tide, it was rather uncomfortable on board the vessel, because at times in low tide she was tilted over so that it was very difficult to walk up from the port to the starboard side.

We continued in that way all winter doing nothing very much, except, of course, keeping up the observations all the while. The men, how-

ever, were not employed in any work except every morning to fix around the deck a little. This state of things continued until, I think, it was in February, Dr. Bessels prepared a plan of operations for spring work. In these operations he proposed to send three sledge journeys, one to the eastward to endeavor to reach the east coast of Greenland; one to the southward to join Kane's survey with ours, and one, if possible, to cross the straits to get on the west side. Then he afterward proposed to join the last two sledge journeys together, and let the men who went down to join Kane's survey with ours also cross the straits, if it were possible, on the ice. He proposed that these two sledge journeys should start at one and the same time, and that they should be back in time to start with the boats if there was any opportunity in open water in Robeson Channel. Then he went on to detail in this letter the different plans that the boats should pursue, the direction which they should go, and the manner in which they should provide for the vessel meeting them, or something of that kind. Then Captain Buddington in reply to this letter, approved of Dr. Bessels's plan of sledge journeys, and said he would do all in his power to carry them out, but that as regards the boat journey he intended to send it himself. He considered it too early, however, to make any arrangements as to the details of the journey. I suppose he wrote that letter because the instructions gave Dr. Bessels control of the sledge journeys in addition to that of the scientific work. Along in March, I think it was the 27th of March, Dr. Bessels proposed the sledge journey to the South, to join Kane's survey with ours, and I accompanied him. We took two natives with us. We started out with one sled, and one native, but the native found it was too hard work for him alone, so he wanted to go back, and he did go back and brought the other native along with him and another sled; we went down into Kennedy Channel along the east coast a little distance, when we came to open water. We could go no further with the sledges, so we returned to the vessel. We were only gone about a week.

Question. How far did you go, and what did you find out on that journey?

Answer. We found out that Kane's farthest point—Morton's farthest point when with Kane—what is called Cape Constitution, was in a little lower latitude than is represented on the maps.

Question. Did you go down to that point?

Answer. No; we could not reach that point. We went down in sight of it, but we could not reach it on account of the open water—probably the same open water that Mr. Morton saw. It was in the same position at any rate, but we could not reach it. The ice foot gets very narrow in that place, I suppose on account of the strong current tearing it away as fast as it forms; and what little there was of it was piled up with large pieces of ice, so that we could not get a sled over it at all. We walked a long distance over it, but there is a limit to walking expeditions, especially when you carry no food with you, and have to go back to the sled to get something to eat. We went down however until we saw Cape Constitution, which was about 20 miles off, I presume.

Question. Twenty miles to the southward from where you went?

Answer. Yes.

Question. Did you take any observations there?

Answer. I did not exaetly take the observations for latitude at the farthest point we reached on the coast, but I took observations for latitude at a little island where we made our encampment, and I made the latitude 81° 5′.

Question. And Cape Constitution is how far south of that?

Answer. I suppose it is about 25 or 30 miles south of that.

Question. About one-half a degree?

Answer. Yes, sir; a little less than that.

Question. How do you know that was Cape Constitution?

Answer. We knew it from the description we had of it. We were not quite sure at that time, however, although Hans who was with us was the same man who was with Morton. He said it was the same place, but still we did not regard that as very reliable, inasmuch as you can hardly expect a man to remember a place that he has only been to once, and that nearly 25 years ago. But coming down in the vessel we drifted very slowly past that, and then we had an opportunity to see it, and we knew it was the same place that we had seen before. As I said, on this journey we were gone about a week and then returned to the vessel.

Question. Did you go to what is called the Southern Fiord?

Answer. Yes, we ran into that some distance—some twenty or twenty-five miles.

Question. Did you find how deep it was?

Answer. No, we could get no end to it. We were stopped by icebergs. The icebergs ran right across it. We could not get the sled up at all. On board the vessel not much was done except to get the boats ready to start. Captain Buddington ordered Mr. Chester and Captain Tyson to be ready to start by the 1st of May, I believe, and then to start after that just as soon as, in their judgment, they thought they would be able to do anything. The two started early in June; I think the 6th. Mr. Chester started first with his boat, but he did not get more than a mile above Cape Lupton, when he lost his boat. He then returned, and as he returned, Captain Tyson started off with his boat. Mr. Chester prepared the Hagleman canvas boat, and started off with that. After they had all gone, Captain Buddington set the rest of us at work to try to get the vessel out. We sawed the ice for one or two days there, and at last got the vessel so that she would float. As soon as she floated she began to leak much worse than she did before, and we were compelled to keep the little engine going. We took a trip out after we got the vessel adrift to try to catch up with the party that had gone off in boats. We thought they might be half-way to the north pole by that time; not having heard anything from them, we thought we would try to reach them. We coasted along and got very nearly up as far as Cape Brevoort, but we found the ice packed close and heavy. We several times sailed up and down along the edge of that pack all the way from the east to the west coast. Finding no chance of entering, we returned.

A few days after the return from our voyage, two men came over from Mr. Chester's boat, and they told us that Mr. Chester had gotten out of provisions and wanted more. They informed us that the boats were up in the mouth of Newman's Bay; that they had not been able to get any farther, and that there was apparently no prospect of getting any farther. Captain Buddington thought if he could get both the crews back to the vessel, we would be able to work the deck-pumps and keep the vessel dry. He thought we would be able to watch the opportunity to get north from the vessel just as well as from the ice-floe up in Newman's Bay, and have just as good chance to get north with the vessel as with the boats. So he kept those two men on board, and sent the native Hans over with a letter to Mr. Chester, telling him to return.

After a while the native returned with Dr. Bessels, bringing a letter from Mr. Chester in which he stated that they would return as soon as they could get their boats down. He said they would wait there

until the ice opened, and then they would bring their boats down to the vessel so as to save them. But Mr. Chester wrote again and said that he wanted provisions, and that he would like to have at least one of his men back.

Captain Buddington went out again in the vessel for a third time, I think, and not finding any chance to get the vessel in at Newman's Bay, he landed these two men up as near to Newman's Bay as he could get the vessel, and then gave them some provisions to take over to Mr. Chester. He then told them to tell both Mr. Chester and Mr. Tyson to come over as soon as possible. After a while Mr. Tyson and his crew came over, having left his boat over at Newman's Bay, and shortly after that Mr. Chester and his crew came over. Mr. Tyson came first. After they were all on board we got the deck-pumps started and kept the vessel clear. We kept her clear a good deal easier than we thought we would be able to do; and by dividing the whole crew into three watches we were able to keep the vessel clear by pumping five or ten minutes only in an hour. We did not do very much after that until we started for home. That was the 12th of August, and the reason given for going home at that time was that the vessel was leaking, and we did not have more than enough coal to last us through the winter. If we had staid there our fuel for cooking and warming purposes, and keeping the vessel clear of water, would exhaust all the coal during that winter. Then the next fall, if we tried to get home we would have to trust to sail, and it was not thought right to trust only to sail, as we might not then be able to get down; so it was concluded to start for home that fall. On the 12th of August, although the ice looked pretty close around, still from the top of the hill we could see the leads of open water running down to Kennedy Channel; and so we started. We got down to the mouth of Kennedy Cannnel, I think, in one day. Then we were delayed a little. I cannot recall every little occurrence, but I remember that we tied up two or three times to a floe, and then started again. We were permanently tied up on the 19th of August. We started down on the west side of the channel, but our leads led us all the time in toward the east until we got to where the leads ended, and then we got stuck. They kept running all the time toward the east. All the leads just happened to be in that direction, and we took that direction thinking we could work out again. We were not able, however, to do it. After we got farther down, I believe on the 26th of August, we made another attempt to get out, but the vessel was not heavy enough to move the floes around. I think that that was the only time where we would have been benefited if we had had a Scotch whaler in the place of the Polaris. They are heavier vessels, and more powerful, and can move larger pieces of ice. They might possibly have gotten out at that time, but we could not.

We drifted very slowly down through Smith's Sound, tied up to a floe. It was quite a large floe, and going down we built a house on the floe, having found a pond of fresh water. We dug holes in the ice and stuck small poles in, and covered them with the old awning that was on the vessel the winter before. We put 15 cwt. of bread in the house. That was to provide against any accident occurring on the vessel. We were just quietly drifting down. Sometimes we would drift a very short distance in a day. As we got farther down we drifted quite rapidly, so that on the 15th of October, the last time we saw the land, we were a little below Gale Point, on the west side of the strait, and were a little closer to Gale Point than to the opposite point on the east coast. That was the last point of land we saw. That will give a little idea of where the ves-

sel was when the ice-party broke adrift. I am not certain whether it was on the 15th or late on the 14th that we saw Gale Point, but I know that was the last chance we had to place the vessel before the ice-party broke from us.

At 6 o'clock on the 15th of October, one of the seamen came running into the cabin and told the captain that the ice was breaking alongside of the vessel. The vessel was fast to the floe on its port side. We went out, and in a short time the ice on the starboard side of the vessel all swept past, and there was open water there. Then, shortly afterward there was ice there again. Whether the ice came against us, or we swept against the ice, I could not tell; but the ice gave us a pretty good squeeze when it came there, especially around the stern of the vessel. It cracked the timbers a good deal, and tilted her up, and there was some considerable chance of the vessel being broken. So Captain Buddington ordered things to be thrown out on the floe. We threw everything out. We in the first place took our records out; that is, Mr. Meyer and myself did. Then we threw over everything that was on the deck. We had provisions, &c., piled on the deck for this special purpose, and we threw them out on the ice. The pressure was so great that it was breaking off pieces of ice alongside, and caused a space there to be filled with broken pieces. As we threw the things out there was danger of their falling through the ice, so a party was sent out to take these provisions away from alongside the vessel, and carry them back on the floe, where they would be safer. The Esquimaux had gone out before, and several of the seamen went out. No one was selected especially to go out, only there was a general call for some men to go out there and help to move these things, and these men went out. I think a little after nine we had thrown everything out, but these men on the ice had not removed everything, because they had not gone out as soon as we commenced to throw over.

There were two hawsers fastened to the stern of the vessel, and one to the bow, and during the first part of the gale one of these stern hawsers was fastened to a cleat on the side of the vessel. The pressure was so great that it just snapped this cleat right off, and then both hawsers were brought to the mainmast and fastened around it. Then toward the close, about 9 o'clock, after a good many things were on the ice, after the boats were on the ice, and the men were on the ice, the floe that they were on began to break up; that is, the edge of it. We supposed that the floe must have been broken just where our stern anchors were in, and consequently the stern anchors drew, and that swung the vessel's stern around and brought all the pressure on the forward hawser. Then the forward hawser seems to have slipped off. As near as I can understand, this piece had been fastened on there a little carelessly; at any rate it slipped off, and that let the vessel get away.

We soon lost sight of the party on the ice in the distance.

Question. Was this a dark night?

Answer. Yes. The moon was trying to shine, but it was not doing much. There was drifting snow and heavy clouds, so that we soon lost sight of them.

Question. This parting was wholly accidental then?

Answer. Yes; that is, as far as our party was concerned. It was entirely accidental unless some person maliciously cut the rope, which I have no idea was the case. We thought from the pressure being so much on the stern that the rudder was broken as well as the propeller. We did not know exactly what to do, but the two men were working the pump in the alley-way—I forgot to tell you why working the pump

in the alley-way was necessary. The vessel had been pumped out by a very small steam-pump, for which steam was made in the little boiler, that only required as much coal as a common stove. After this little pump had gotten out of order, the engineers were repairing it, and while the work of repairing was going on, the pump in the alley-way was kept continually going by four men, who relieved each other. After we had drifted away from our companions, they told the captain they did not think they were pumping the vessel clear, because it did not suck; it used to suck occasionally. The fireman went down and examined, and found the water gaining very rapidly. The captain ordered the fireman to get up steam so as to work the larger steam-pump, and then he started the deck-pumps. We worked the deck-pumps for about an hour, but still the water was gaining a little on us; only a little, however. In that hour the firemen were able to get up steam. Just as we got up steam the water was running over the fire-room floor; but as soon as we succeeded in getting steam up, the steam-pump kept the vessel clear. That was then about 12 o'clock. The weather had moderated a great deal; the wind had died away, and the moon came out a little brighter, so that we could see better. We could not do anything, and so we sat up in the room waiting for daylight. We could not get to sleep. We had thrown all our bedding away out of the cabin. When daylight came on the 16th, we found that we were in young ice about four or five miles from the shore, and on the east coast about two miles above Littleton's Island. As soon it got to be daylight, so that we could see pretty well, Captain Buddington sent Mr. Chester up to the masthead with a glass to have him ascertain if he could see any of our comrades who had floated away from us. He came down and reported that he could see a piece of ice astern of us out in the straits; that there was something that looked like barrels, or boxes of provisions, but he could not see any signs of the men. That satisfied us all. The reason it satisfied us was because we had an idea that the wind drifted us away from them, and that the current acted against the wind, and took them down, or at any rate did not permit them to follow us, the consequence of which was that there was a great distance between us. We had no idea at all that any one could see them. So when Mr. Chester came down and reported that he could not see them, it just satisfied us at once that they were too far off to be seen. That is the reason no one else went up to look.

A breeze sprang up pretty soon, which broke up this young ice and made lanes through which we worked the vessel into the shore; and we ran her aground. As soon as she was aground, at low water, we looked at the bow. The lower part of the bow was broken off entirely. It was just lying alongside the port side of the vessel. It was still fast, but just bent around. We had thrown away a great deal of coal, but we had four or five tons in the bunkers. Of course we could not, with only these four or five tons, keep the vessel afloat, and so we concluded that the best thing that we could do was to build a house on shore. So we went to work doing so. The natives came and helped us, and in four or five days we were all on shore. The vessel was then abandoned. Everything valuable that was in the vessel, before she was allowed to fill up with water, was either taken ashore or placed on the upper deck, so that we could return and get it if we needed it. Everything that could be used, in fact almost all movables, of whatever character they were, were taken off. We then lived in this house until the 3d day of June. Then we started down in the boats that Mr. Chester had built with the assistance of Booth and the carpenter, (Mr. Coffin,) out of the Polaris.

We started on the 3d of June. On the 23d of June we had gone as far as about twenty-five miles southeast of Cape York, and there we saw the Ravenscraig, and abandoned our boats, and took our personal effects and walked over the ice to her, a distance of about eight or ten miles. We were received by the Ravenscraig people very kindly. That ended the expedition.

Question. Was there any other attempt made to ascertain if you could see the men on the ice except Mr. Chester's going up to the mast-head that day?

Answer. No, sir; that was all except what a person could see from the deck. No one saw them from the deck. There were several looking from the deck for them.

Question. Didn't anybody else go up to the mast-head?

Answer. No, sir; not that I recollect of, and I think I recollect pretty accurately about that, because I remember I reproached myself all winter because I did not do it.

Question. Didn't Henry Hobby go up?

Answer. No, sir; not that I know of. He might have gone, though, but I do not remember that he did. We were pretty busy there during the remainder of the day. He might have gone up when I was not looking, but I do not remember of anybody else but Mr. Chester.

Question. Would you have been put to any inconvenience if you had picked up the lost portion of the crew with the provisions and stores? Suppose, for instance, the stores and provisions had been lost on the ice, and you had taken back the men; would it have been at all difficult to have supplied them with provisions?

Answer. In the first place we would have had to practice a little economy, and in the second place we could not have been so generous with the natives. Otherwise I think we had the means to provide for them.

Question. The men on the ice had as much stores as you had, had not they?

Answer. I do not know. I could not tell. They had a great deal.

Question. Did you have any interesting personal adventures after you were put on board the whaler to come home? Why were you delayed so much longer than those who were on the Arctic in getting back?

Answer. I could not tell exactly. The Ravenscraig divided the crew. There were about seven on the Arctic. Then the next vessel they met was the Intrepid, and the captain came on board, and they got to talking, and then decided to put three on board the Intrepid. The captain of the Ravenscraig signified which three he wanted to go on board the Intrepid. Before that he had tried to make us decide for ourselves who should go. We went on board the Intrepid, Mauch, Booth, and myself. We remained there, I believe, until the last of August. Finally the Arctic got ready to go home. The Arctic claims that she ran the ensign up signaling her intention to depart, so as to give the rest of the fleet a chance to send their letters home by her, but the captain of the ship we were on declares that he did not see it, and that he was watching him every once in a while during the day, because he thought that the Arctic was pretty nearly full, and that she would be going home soon, as the captain is a man who always does get home if he possibly can before the others. The captain's name was Adams. The captain of our boat did not see him put up the flag, but he saw him go up by the Ravenscraig, and saw boats passing between them. It was some distance off, but then he had a very good glass. He could not, however, state positively whether our men had gone on board or not. That was the last we heard of it, until we met some parties that had been near by

or that had been on board the Ravenscraig or the Arctic, and found out about it. They told us that the Arctic had taken the Ravenscraig's people home.

Question. Did the Intrepid make a course in and about the same direction as the Arctic? Did you go over toward Parry's encampment, or did you go in a different direction?

Answer. No; we went in Prince Regent's Inlet, down on the regular whaling ground there. We did not go quite as far as the Arctic. The Arctic went up past Fury Beach. They landed there and got Parry's provisions, &c. We went nearly up to Fury Beach, but did not see any particular use in going there, because there were no whales there. We then came back.

Question. Did the Intrepid get a good supply of whales?

Answer. Yes; she got a fair supply. She had nineteen whales when we went on board, and she got five afterward, which made twenty-four; about 163 tuns of oil, while she could only hold 170. So she did very well indeed.

Question. So she did not lose anything on your account?

Answer. No, not at all. Nobody did. The Ravenscraig did not lose anything on our account. She was, however, unsuccessful, procuring only one whale, and that a dead one, producing only three or four tons of oil.

Question. Did the captain go out of his way on your account?

Answer. No, sir; not a particle. He did not have to leave, either, on our account. He could have staid there as long as he pleased as far as we were concerned.

Question. Did the Eric have any of your party on board?

Answer. We staid on the Inteprid until the 24th of August, and then the Eric got ready to go home. She ran up an ensign. As soon as that was done the Intrepid bore right down to her—not for the purpose of sending us home, but for the purpose of having letters taken. But after they had gotten the letters, then Captain Walker, of the Eric, said, "I am going home, and if these Polaris men would like to go with me, I will take them." Of course we wanted to get home as soon as possible, and we went with them.

Question. How much later did the Intrepid get in than the Eric?

Answer. About two days.

Question. How much later did she start?

Answer. She started a good while later. She passed Cape Farewell four days before we did. The reason of that was this: If you will remember, there was a company sent out to find some minerals out in that section, and the Eric was chartered for the purpose. There is still coal there, 85 or 90 tons, and the Eric generally puts in there for fuel. So that instead of going right across Davis's Straits to run for Cape Farewell, she ran down the coast in order to make Exeter Sound, but when she came opposite Exeter, she found that there was so much ice that she could not do it. Then the southwest or southerly breezes commenced and kept her up there, so that she could not get out. She did not want to use steam. Whalers generally try to get home under sail. In the first place the coal is pretty well used up, and then they need some to work around the coast of Scotland. So she could not get out of there for a long time, and the Intrepid got around Cape Farewell four days before she did, but the Eric got home a day or two ahead. That, however, is the reason of our detention.

Question. You were treated well on board these ships?

Answer. Yes, very well indeed.

Question. Was anything supplied to you by anybody?

Answer. The captain of the Intrepid gave me a little clothing out of his chest, and then I got a pair of shoes from one of the men. The captain said he would have that settled. I told him to send the bill in to the American consulate at Dundee. I have not heard anything from it, but I expect to.

Question. Where did you mess?

Answer. Aft with the captain, mate, and the doctor. The other men messed with the ship's company. In the second vessel they messed with the cook. They were given cabin fare on board the Eric—given everything they had in the cabin, only they did not come there to eat it.

Question. They all treated you well, then?

Answer. Yes.

Question. Did you know of any difficulty between the people on board the Polaris at any time?

Answer. Nothing serious. There were difficulties, of course, but only such as I think any crew would have under similar circumstances.

Question. Was there any difficulty among the officers—any difficulty between Captain Hall and any of the officers?

Answer. Nothing serious. They had their little rows once in a while, but I never saw anything that could be said to be at all serious. They were just little differences, that was all.

Question. Did you ever, after Captain Hall's death, hear anybody express himself as glad, or as being relieved by Captain Hall's death, or anything of that kind?

Answer. I could not say that I did. I do not remember anything positive. I heard that some persons said that others had said so, but I do not remember that any one ever said so to me. I have often heard, however, that persons had said so.

Question. Who did you hear had said so?

Answer. I heard that Captain Buddington had said so; that Dr. Bessels had said so. I do not know that there are any others.

Question. What did you hear they said?

Answer. I cannot remember the exact words; it was expressing relief as though they had been under some kind of restraint which was not pleasant, and they were glad it was over.

Question. How was the discipline of the ship while Captain Hall lived?

Answer. It was very effective; that is, if anything was wanted to be done, it was sure to be done. Captain Hall, I think, was a very kind man.

Question. Pretty good disciplinarian?

Answer. I could not say that; I do not think that he had very much executive talent; but I know that while he lived he had order and what would be called discipline—that is, everthing he wanted to have done was done.

Question. Was anything done that he did not order; was anything done that was in any form a violation of the spirit of his wishes?

Answer. O, no, I think not, except temporarily that case of Mr. Meyer's; that was at Disco. He refused temporarily to do what Captain Hall wanted him to do; but that was owing to a misunderstanding all round. It was settled afterward.

Question. How was the discipline after he died?

Answer. Well, it was a good deal easier—that is, there was more freedom, but I think everything that was necessary to be done was

done. Captain Buddington was very easy with every one. He tried to get along without having any disturbance or row. I think I can say very safely that everything that was necessary to be done was done.

Question. Was there any difficulty between Captain Buddington and Captain Tyson of any kind?

Answer. No; that is, no difficulty in regard to the business on board the ship.

Question. Did their relations appear to be cordial between each other?

Answer. Yes; after some lengthened conversation, perhaps, there would be a want of some little cordiality, but after a short time they would be very friendly.

Question. Do you know anything about whether Captain Buddington ever got drunk?

Answer. O, yes; he did get drunk, but not very often. I could not tell you how many times he did get drunk, but occasionally he would get so.

Question. Was that before or after Captain Hall's death?

Answer. Both.

Question. This night that you got beset finally in the ice, in the middle of Kennedy Channel, was he drunk or sober?

Answer. I do not know that on the night that we finally got beset that he was, but I know that in coming down there one night he was drunk.

Question. Drunk enough to incapacitate him from duty at all?

Answer. I do not know. It is pretty hard to tell. Some men when they are drunk can do a good deal better than when they are sober.

Question. Was that the case with Captain Buddington?

Answer. I do not know. I cannot tell you. I did not think at the time that he was doing anything out of the way, and I do not know anything that he did out of the way. Of course I believe it would have been a great deal better for him if he had been sober, because I do not approve of people getting drunk. Still I do not think that at any time his getting drunk incapacitated him from doing his work or interfered with the service. There is one thing, however, to be said regarding Captain Buddington, and that is that everybody has been saying he was drunk. It is true enough that he was drunk at times, but it must be taken into consideration that very few glasses will make him drunk, and it is hardly fair, therefore, to talk so much about his being drunk when he really did not drink quite as much as some others did. If he took a couple of glasses they would go right to his head. Of course he did not do right in getting drunk, but I think he is blamed a great deal more for it than he ought to be.

Question. Did anybody else get drunk?

Answer. Yes, there were several that got drunk.

Question. Where did they get the liquor?

Answer. Liquor was on board the vessel, put up under the head of "hospital stores." They took it and drank it.

Question. Did they take it while Captain Hall was alive?

Answer. Yes.

Question. Did they steal it?

Answer. Yes, they stole it.

Question. Did anybody know when they took it?

Answer. In a closet in the cabin there was some liquor that the doctor had stored away there. I frequently saw a person with a key that he had for that go in and get it. Then there were other liquors stored in

other places that they got into and got out less openly, because, of course, the place where it was kept was in a more remote part of the ship. When Captain Hall was alive I do not think the officers took much, but I think the men forward got a little, though I never saw any of them drunk at all.

Question. To what extent do you suppose that liquor was used?

Answer. A good deal of it was used toward the last when other material was used up.

Question. After Captain Hall's death was this permitted? It is a question of discipline. Were officers permitted to go and take liquor and get drunk?

Answer. O, no; nothing of that kind. Of course when the officers did go and take the liquor and did get drunk, all that could be done was to accept the fact, and keep them quiet and get them to bed as soon as possible. I do not think that Captain Buddington ever authorized the use of liquor in any way.

Question. If he did not authorize it did he permit it? Did he try to stop it?

Answer. I do not think he made any very strenuous efforts to stop it. I do not know, because I believe that the only way that it could have been stopped by a person who wanted to stop it was by taking all the liquor on board the vessel and throwing it overboard.

Question. Who was it that took the Doctor's liquor in the cabin?

Answer. I have seen Mr. Schumann take it. He was the engineer. He made a key to that door. I do not remember any other one.

Question. Did the Doctor know that he had the key?

Answer. No, sir; not that I know of. I knew it.

Question. Did any of the officers get drunk while Captain Hall was alive so that he knew it after they started from New York?

Answer. I do not know.

Question. Did this habit of taking liquor and getting drunk happen during Captain Hall's life-time, and did he know it?

Answer. No, sir; I do not think the officers, during Captain Hall's life-time, took the liquor. I never saw anything of it, and never heard anything of it.

Question. Then that matter of taking liquor by the officers was after Captain Hall's death?

Answer. Yes, as far as I know, but I know Captain Hall used to miss liquor, because I remember of his opening a box of liquors and finding a bottle or two empty, but it was explained afterward where that went to. It was not known at the time.

Question. Where did that go?

Answer. The men took it. They crept in through the shaft of the engine, and up through there after the liquors.

Question. Then, from your statements, you did not know of any of the officers taking any of the liquor and drinking it while Captain Hall lived?

Answer. No, none of the ship's liquor.

Question. After he died, if anybody wanted liquor, could they go and get it?

Answer. No, if anybody wanted it he could go and get it—that is true enough—but such a one had to watch his chance in order to get it; had to steal it, in other words. The liquor was not at any time put on the table except at Christmas, when we had a little wine on the table, and at New Years, and such festal days as that, they had bottles of wine out on the table, but each one only had about a glass around. There was no time when any one could go and get liquor, unless he stole it.

Question. Where was the liquor kept?

Answer. It was kept in different places. Some of it I say was stored in this closet in the cabin, and a good deal of it down in the hold—down in the lockers in the hold down aft; and I think Dr. Bessels had some in his room.

Question. Alcohol?

Answer. Alcohol and other liquors too, I believe, but I do not know positively about that. I know he had some alcohol, because he showed it to me. His bed was fixed up so that below his bed there was an opening. I know that he showed me some alcohol that he had stowed away in there in his bunk. Then, besides that, there was some liquor in the main hold of the vessel down with the rest of the provisions.

Question. At the time when you separated on the ice was Captain Buddington drunk or sober?

Answer. Sober.

Question. Did he destroy the liquor that was left after you got up beyond Littleton's Island himself?

Answer. Well, I think he did it himself, but I do not know. He might have got somebody else to do it, but there was some alcohol left, and one or two got tight, and then Captain Buddington said there was no use in this thing; that if we had to live there we must have sober men to live with, and so he just went to work and destroyed all the alcohol he could find.

Question. Did the doctor make any remonstrance about that?

Answer. I do not believe he knew it. It was the only way of doing it. We could not expect to have it around there and the men not get at it. I believe the doctor did medicate several of his cans—put in them some tartar emetic.

Question. When you separated on the ice on that night what became of your records?

Answer. I put them out on the ice the very first thing.

Question. What did they consist of?

Answer. Astronomical observations that I had taken up to September 5th of that year; also the magnetic observations; that is, the observations for the variations of the magnetic needle, which were continued hourly for about four months. Besides which they contained all my dip observations, and all for absolute determination of the variation; all the observations that I had made for that purpose, and they contained, also, some observations for relative intensity and for absolute intensity, and I think a few for the absolute declination made with the magnetometer. They were all in the box. Among other things there was a collection of plants. I had several specimens of every species of plants that were found there. I think I had one plant that Dr. Bessels did not have in his collection. He had three or four grasses that I did not have; but I had a little plant that he did not have.

Question. What was it?

Answer. I do not know what the name of it was.

Question. Were Dr. Bessels' saved?

Answer. Yes; everything that Dr. Bessels had was saved, except a very few papers. In fact, I do not know that anything of his was lost.

Question. What observations did you take; what was your work?

Answer. Astronomical, magnetic, and pendulum observations.

Question. And the records of all these were lost?

Answer. All except the pendulum observations, and those Dr. Bessels took charge of.

Question. Have you any means of reproducing any of the more im-

portant results or data of this series of observations? Have they gone out of your mind? Have you made any reductions?

Answer. I have not been on very many different points, that is, of any particular importance, except when at our winter-quarters, and the two points that I visited on the sledge-journey. The rest of my observations merely gave the position of the ship as she was drifting down. Then the magnetic observations—the absolute variation—I have got that; that is, approximately. I worked up a few of the observations.

Question. Shall you be able to work out any facts in regard to these matters that are not provided for in Dr. Bessels' labors? Have you any data? For instance, have you the means of securing any data in regard to the physical condition of the North that Dr. Bessels has not got in his papers, or that you have not already communicated to Dr. Bessels, and of which he has made use, or can make use?

Answer. When Dr. Bessels and I went down on that sledge-journey to the south, after we separated from our sled we walked, and I carried the theodolite. Then the observations that I made at that time—that is, the bearings of the different places for the determination of the positions—were placed down in Dr. Bessels' journal by himself. I took them, and he worked with me and placed them down. That little work—it did not amount to much—it was only three or four points that it was intended to establish—but all these bearings that I took depended for their value upon the height of a mountain near by. The height of that mountain Dr. Bessels has not got.

Question. Have you?

Answer. It is only from my memory; that is all.

Question. Have you any data that will tend to perfect or improve the map that the Hydrographic Office has made from Dr. Bessels' observations?

Answer. No; I have given them all the information I have on that subject. It is merely from memory.

Question. What is the character of the property in the apparatus and material that was taken ashore from the Polaris to your winter-quarters on Littleton Island? Have you made out at all a list of the instruments that were saved? Were all the instruments saved and removed from the vessel?

Answer. No; not all the instruments. The transit instruments and the pendulum instruments were saved, beside the chronometers.

Question. And what was left on board?

Answer. No instruments whatever.

Question. Or records?

Answer. None.

Question. You removed everything?

Answer. Yes.

Question. Did you bring off with you, when you embarked the following spring, all these things, or did you leave some behind?

Answer. No; they were left behind.

Question. Did the Tigress bring back some of these things?

Answer. No; they did not find these instruments.

Question. What became of them?

Answer. They were back a little distance inland; perhaps a quarter of a mile from the house.

Question. Didn't you tell the Esquimaux?

Answer. Yes; the Esquimaux were right around, saw us put them there, but then the Tigress had no means of finding out where they were except by interviewing the natives, and they did not stay long enough

for that purpose. I think I can answer there is not much there. We did not leave anything valuable. The log that has been spoken of, that was preserved, was the log that Mr. Chester wrote. He found he had made a mistake in the first one; that he had left out a day in it, or something of that kind, and so, instead of correcting the mistake, he started a new one and copied the whole thing up to that date, putting in the day he left out. Then he kept on writing the log. He had two large books. Then he condensed these two large books into a log-book, that he brought back here, and these two large books were buried when we left the house, with the instruments. The old log, that had been copied twice, was left knocking around the house.

Question. That was probably brought in?

Answer. I presume that is the one that was brought, because the other two were carefully wrapped up in oil-silk and put in the trunk with these other books.

Question. It never occurred to you, I suppose, that a vessel might be sent up to your winter-quarters?

Answer. As our time of absence had not expired we had no reason to suppose that the Government would send a vessel to our aid. We thought they might do such a thing, but concluded the best thing for us to do was to look out for ourselves. As soon as we found, by going on board the whalers, that the other party was picked up, we were then certain that a vessel would be sent out.

Question. Would it have been better for you to have remained until the Tigress came up?

Answer. I do not know whether we could have remained there that long. It would have taken pretty strong discipline to have kept some of the men there. If there had been a certainty of a vessel coming, possibly it might have been done. You see it would be two months thrown away, because during those two months we might have reached the settlements, whereas, by staying there two months, and no vessel coming, we might not have reached the settlements.

Question. Were not you exposed to considerable danger by sea?

Answer. We had not been, up to the time we were picked up. It is true, the worst part of our journey for our boats remained to be gone through with, because, as you come down farther south, you meet with less ice, and consequently have heavier sea, whenever the wind blows.

Question. Do you know what became of Captain Hall's journal?

Answer. After his death all his documents were put in a large tin box, and kept there, and that box was put on the ice with the other things.

Question. You remember that?

Answer. I did not see it actually put out, but the man who had charge of it (Mauch) told me he put it out, and I believe him.

Question. After Captain Hall's death, was there a formal examination of his effects?

Answer. There was not.

Question. No sealing up or taking of an inventory, or anything of that kind?

Answer. None that I know of. I remember the day Captain Buddington looked over his things. He looked in all the different places and around the different desks, and put everything in this one box. He did it there in the cabin. There was no formality about it.

Question. Have you any idea that Captain Hall died from anything but natural causes?

Answer. No, sir. I have no reason for believing otherwise. I be-

lieved at the time he died from natural causes, and I have had no reason to change my mind since.

Question. Have you seen this chart that Meyer made?

Answer. Yes.

Question. What general criticism have you to make in regard to that?

Answer. I think he has got Cape Constitution a little too low down. I think, also, that he has got too great space between Franklin Island and the island four or five miles off the west coast of Kennedy Channel. Then the coast above Cape Constitution, and between that point and the southern shore of the southern fiord, is not very accurate, according to my recollection. The reason of that is that Mr. Meyer was never there. This was traversed by Dr. Bessels and myself.

Just on the promontory represented on Meyer's map between Kennedy Channel and the southern fiord there is another small fiord, which runs in for about twelve miles. I did not go into the fiord. Dr. Bessels went up to the top of the fiord. He told me it was about twelve miles. And there is another small island besides the one represented on the map near the shore at that place. It was on that island I took the observation, and made the latitude 81° 05′ north. I never was on the land above our winter quarters farther than a day's walk—just a little above Cape Lupton on this high land.

I do not know of any other criticism I have to make on the general outline of the map. I was not on the land myself higher north than about Cape Lupton, as I have said, and so my knowledge of the lay of the land above that is only general.

Question. What sort of animal life did you find up there on the land?

Answer. We brought in rabbits, foxes, musk-ox, and there were quite a number of little lemmings running round. We noticed their peculiar track on the snow in the course of the winter. We did not know what it was for a long time, but when the spring came we caught a great many.

Question. Any blue foxes, or all white?

Answer. I think we only got one white fox up there. That is all I have any remembrance of.

Question. Any wolves?

Answer. There were reports of wolves having been seen, but I think it is very doubtful.

Question. Any brown bears?

Answer. None.

Question. Any white bears?

Answer. The doctor found a white bear upon this fiord I was telling you about, which extended twelve miles in. He found a white bear there that Joe killed. That is the only bear we met with on the expedition.

Question. Any white partridges?

Answer. Yes, sir; quite a good many in the spring.

Question. Did you kill many of them, and eat them?

Answer. I never had but one mess. I do not know how many there were. They had a good many messes, I believe, when the doctor and I were gone on the sled journey.

Question. Any white owls?

Answer. There were none caught. I believe Joe saw one.

Question. Any hawks?

Answer. I do not know exactly. I never saw a hawk that I am aware of.

Question. Any eagle

Answer. None.

Question. Any sea-gulls?

Answer. Yes, a great number of gulls, of different kinds. We used to see the burgomaster. That is the large gull. Then we saw what, I think, are called the "swallow-tails." That is the English name for them. They were white on the lower part—the belly—with a kind of grayish, bluish tint on the back. I do not think the top of the head was black. I think both the feet and bill were red. They may have been the Arctic terns, but they were called "swallow-tails."

Question. Did you see any sabine gulls?

Answer. Yes, but they were not common. I killed one, and Mr. Mauch killed another.

Question. Did you see a small gull about the size of a sabine gull—white gill, with a black ring around his neck, and with a wedge-shaped tail—no central tail feather?

Answer. No; we saw quite a number of the gull-chaser.

Question. Did you see any whales?

Answer. I did not see any whales until after we got into Lancaster Sound—not what they called whales. Some people call narwhals whales. I think we saw narwhals first around Whales Sound.

Question. How far north did you see them?

Answer. I do not think we saw them higher than 77°, perhaps 77½°.

Question. Did you see any walruses?

Answer. Yes.

Question. How high did you see them?

Answer. Where we wintered the last time—about 78½°. In regard to those narwhals, when we drifted down in the ice through Smith's Sound, in a hole of water, we saw two fish come up. Captain Buddington said they were narwhals. I remember they went out after them to shoot them, but they disappeared before they could reach them. Mr. Chester said they were narwhals. If they were narwhals, then we saw narwhals a good way above 77½°. That was about 79°.

Question. Were the walruses very abundant?

Answer. The natives seemed to catch quite a number; and in the spring we could see quite a number on the ice.

Question. Did they catch both sexes, or only males?

Answer. They caught females, because they one day brought a little embryo walrus for us to eat. They said that they had gotten it from the inside of a walrus.

Question. Was it good?

Answer. We did not have courage enough to cook it. It was almost too young.

Question. You are sure that you saw males, also?

Answer. I do not think I would know the difference.

Question. You found no fish of any kind up in Kennedy Channel?

Answer. No; we saw seals all the way up. I saw the salmon on board the whalers. That was pretty well down. We did not see any fish of any kind in Polaris Bay. We tried several times to catch fish by throwing lines overboard, but we did not succeed. The sea was full of shrimps, and there were some medusa jelly-fish, but they were not so very numerous.

Question. Any clams, or shell-fish?

Answer. No; we did not see any.

Question. Do the seals live on the shrimps?

Answer. I could not tell you that.

Question. Were there birds in sight during the winter?

Answer. No.

Question. During neither winter?

Answer. The last winter we saw them very late, and very early. I do not think we saw them exactly in the middle of the winter, but we saw the ravens very late and very early last winter, and I suppose they stayed there all the time; but whether they did or not, we have no authority for saying. I will state that very early, when the natives went out to hunt the seals, they found these dovekies. They told us it was their custom to leave their young up there one year, and the old ones would go home. The ones born there would remain one winter, but ever after that they would go home. That is all I know about it.

Question. Is that probably because the old birds change their plumage in the winter, and look like young ones?

Answer. No; the natives could not be deceived in that way.

Question. This (exhibiting a map to Mr. Bryan) is a map of Hayes' Expedition, published by the Smithsonian Institution, January, 1865, in which he has laid down the highest position that he reached, at Cape Lieber, and in going up this sledge journey to Cape Lieber, on the western shore, he states that he saw the open polar sea of Kane, just as it was laid down in Kane's chart, and when he was here at Cape Lieber he saw nothing but open water to the eastward. Now, when you were going up, north of Cape Constitution, and as far north as Cape Lieber, did you see the land on the right-hand, to the east?

Answer. Yes; from the time we entered Kennedy Channel we saw land on both sides of the channel all the way up. When we got to latitude 81° 20′ we were in such a position that the east coast shut in on the west coast, so that we thought we were in a bay, but after going a little farther north we opened out Robeson Channel.

Question. You see the position of Cape Constitution, as laid down on this map, is just below latitude 81°, and between longitude 65° and 66°. What land do you place there instead of the Cape Constitution of Kane?

Answer. Well, I could not tell you exactly what land, and I do not know about its being in that particular longitude, but in that latitude there is land there that I do not think is Cape Constitution. I could not tell you what land it is. We never gave any name to it.

Question. When you were on that island in 81° 5′, did you see the Cape Constitution of Kane?

Answer No. When we were on that island, we were right behind a head-land. We had to go around the head-land and come down to another cape, and then we opened out a cape to the southward.

Question. When on that island you could not see Cape Constitution, but you could when you went to the southward?

Answer. Yes.

Question. What latitude did you reach when you went south on the land?

Answer. I think probably we went seven or eight miles.

Question. What latitude did you reach?

Answer. That would make it a little below the latitude of 81°—a very few miles.

Question. Did you see what you recognized as Kane's Cape Constitution then?

Answer. Yes.

Question. Where was it?

Answer. It was still to the south of us. We supposed it to be about from twenty-five to thirty miles; not directly south, but in a southeasterly direction, I think.

Question. Was the land continuous between you and it?

Answer. Yes.

Question. Was there any open polar sea there, between you and it?

Answer. No. I think not. There was just a bay that went round.

Question. Was Hans with you then?

Answer. Yes.

Question. Did Hans recognize this land to the southward as the place he had been at before?

Answer. At first he did not; but he seemed to afterward.

Question. Is the land that you saw to the southward of you, then, the same land you recognized as Cape Constitution, when you came down in the ship?

Answer. Yes.

Question. Did you see Franklin and Crozier Island off it?

Answer. Yes.

Question. Could you see Cape Lieber from Polaris Bay?

Answer. Yes. We could see it all the time, and even in the winter time, when the moon shone. I will state that near where Hayes laid down Cape L. Von Buch there is a island in the channel, four or five miles from the western shore, which is not laid down in Hayes' map.

Examination of witness being concluded, adjourned to meet on Friday, December 26, 1873, at 11 o'clock a. m., at the same place.

FRIDAY, *December* 26, 1873.

Board met pursuant to adjournment.

Examination of Joseph B. Mauch.

I was born in Germany. I am twenty-four years of age. I sailed with the Polaris from Washington in the capacity of a seaman. I went from Washington to New York, and from New York to New London; from New London to St. Johns, and from St. Johns to Fiskernaes; from Fiskernaes to Holsteinburgh; from Holsteinburgh to Disco; from Disco we sailed to Upernavik, and from Uppernavik to Tessiuisak; from Tessuisak for the north.

During the whole progress of the voyage I kept my own private journal, which Captain Hall directed me to keep, and told me to keep it in my own way, and to put into it everything I thought proper. That journal I have here. It is contained in these two books, which I now produce, written in English in my own hand. It was written, as a general thing, from day to day, but sometimes two or three days were written at one time, when no particular incident happened during the interval. It contains everything that happened, as far as it impressed itself on my mind, and gives my opinions and ideas freely. In it will be found a much more detailed account than I am now able to give from memory.

Question. Can you remember the day when you left Tessuisak?

Answer. I think it was on the 24th of August, 1871, about one o'clock. We passed Cape Alexander on the 27th; sighted that at first at three o'clock in the afternoon. After that we struck the course over across Cape Frazier, and went over along the west coast, and went as far north as the ice permitted us to 82° 26′; afterward corrected to 82° 16′ by Mr. Meyers.

Question. What did you do on board the ship?

Answer. I kept the journal of Captain Buddington after Captain Hall's death, and before Captain Hall's death I kept Captain Hall's

journal. Besides my other business I acted as captain's clerk. I lived in the forecastle during Captain Hall's lifetime, and afterward until about the time of the return from the boat-journey. Then I went into the cabin, because it was handier. I had to take observations continually. The captain said, "You had better live there." Captain Hall told me several times during his lifetime to go there and sleep there, because he needed me in the cabin. He had me there continually. I had to go there every day. But at last I refused to go, for fear it might make some disturbance among the seamen. They did not like me to leave.

Question. Do you remember when you passed Cape Constitution?

Answer. I do not remember the exact date, but I think it was on the 29th. I remember having seen it when we passed it. Captain Hall was on deck pointing it out.

Question. How did you know it was Cape Constitution?

Answer. Because it was pointed out to me. I recollect that I saw the islands in front of it. According to that I took it for Cape Constitution, and Morton and Hans both stated that it was Cape Constitution.

Question. What was there beyond that? Did the straits still continue up?

Answer. Yes; up to Kennedy Channel.

Question. Did you see any open polar sea above that?

Answer. I cannot say I did. Above Kennedy Channel we came to a bay, which we afterward called "Polaris Bay." We sailed on up through these straits then, and came into the bay. At that time we could not make out it was a bay, because we were unable to see the east coast. It was foggy, if I recollect right, all the way up. I remember that I could not see the east coast at that time. The next day, however, I saw it again, and we had gone farther north by a considerable distance. We went up through this bay, and we found what was called by us "Robeson's Straits." We went up into those straits.

Question. How near through?

Answer. As far as I could see. We had not clear weather at that time, and therefore I cannot say how far.

Question. Why did you not go farther than you did?

Answer. We got beset. They intended to go farther, as far as I heard, and Captain Hall called a council of the officers and it was decided that they would go farther north. Dr. Bessels's counsel was accepted of going over to the west coast, as navigation would be better there, and sledge journeys, too. They tried to go over to the west coast. Captain Buddington did not like to take that lead, because he was afraid that he would get beset, and in the evening we did get beset in the channel. We drifted for three days.

Question. Before you got to the west coast did Captain Hall make a landing?

Answer. Yes, sir; he made a landing on the east coast?

Question. More than once?

Answer. He made a landing on Cape Frazer. I think it was twice he made a landing. I think he went there first on the ice, and the second time with the boat, but I am not certain about it. He went to look for a harbor. He found one to suit him, but when we tried to get there the ice closed. It came into the harbor and we could not get in. He called it "Repulse Harbor." It is above Cape Frazer.

Question. Was this the day before you tried to go across the straits, or the same day?

Answer. I do not remember whether this landing of Captain Hall was the same day we tried to cross the straits, or the day before.

Question. When you got beset in the ice did you put provisions out?

Answer. Yes, sir; we did so for fear the ship would be nipped. We drifted down with the current. I think we were in the ice two or three days at that time. I think the dates are in my journal. The first opening occurred at Polaris Bay where the basin widens. The ice gave way and the consequence was we could reach the east coast. We then put into Polaris Bay. We made a harbor there. It was then decided to go into winter quarters at that place. I do not think we were there but a day when Captain Hall said he would go into winter-quarters, because going up I had to work in the fire-room, and as soon as we got there and dropped anchor, Captain Hall called me up and said my work was done there (in the fire-room) for the future. So I think he concluded at that time that he would make winter-quarters at that point. We landed provisions on shore and put up an observatory and went into winter-quarters. After that there were sledge-journeys sent out. There was one sent down south, Dr. Bessels and Mr. Chester. Mr. Chester was in command. Then Captain Hall made a journey himself. I think he left on the 11th or 12th of October. He was absent until the 24th, I believe. He returned at that time and was taken sick. He was gone about two weeks. I saw him when he came back just before he stepped into the cabin. I had some little conversation with him. He asked me how I had got along, and I told him very well. I had to keep a record during his absence and I gave him that, and he said he would look at it to-morrow, or so; that he was tired then. He said that he was tired and it was pretty cold. That was about all he said. I remember of having said to him "You had a hard time of it;" and he said "Yes." Then he went into the cabin, and I was told afterward that he was taken sick. I was not there at the time he was taken sick, but shortly afterward I went in to see him, to see what was the matter with him. I think it was Mr. Morton who told me he was taken sick. I saw him when I went in, but he did not say much. When I went in he was just undressing, and they were putting him to bed. The next morning I heard that he was in a very bad state. I did not say anything to him when I went in. He was very much occupied then. I think Dr. Bessels was there, and Mr. Morton who was undressing him. I do not remember who else.

Question. When you first went in was there anything in particular that you noticed?

Answer. No, sir; nor did I hear anything either.

Question. Did you know anything about his drinking coffee?

Answer. I heard that he had been drinking coffee, but I did not regard it as anything extraordinary. I thought that it was very natural for him to take coffee after he came back.

Question. Had the men been taking coffee then, or about that time; I mean the men on board the ship?

Answer. No, sir; they were not taking coffee at the time. It was specially prepared for Captain Hall, or, rather, for the party that returned.

Question. What appeared to be the matter with him when you saw him, after he was taken sick?

Answer. He seemed to have been vomiting just before. That is all I know. He did not say anything. He got suddenly worse during the night. I heard he was unconscious then. I never went in when he was very bad. I do not recollect the precise date when I saw him after that, whether it was one or two days afterward, but I think it was two days afterward—may be one day. I saw him again, and he was very sensible. He seemed to be very weak. The men always sent me there to ask him how he was getting along every day, and I inquired every morning, and

he was always very much gratified by hearing from the men. As long as he was well I remained in the cabin. I had to remain there. And one day he dictated to me about that report that he left at Cape Breevort. I copied that dictation afterward. Joe and Hans had shot a seal, and I could not get clearly their story, and he was there and had them both tell me. He asked them to do so. He was very sensible then. That was a few days before he died.

Question. Was he out of his head at all during his sickness?

Answer. Yes, sir; but I never saw him when he was out of his head. It generally came on during the night.

Question. Did he accuse people of trying to kill him?

Answer. I never heard it, but I heard others say so. I was only there when he sent for me to do work, and that was when he was most rational.

Question. Did he accuse almost everybody of wanting to kill or poison him?

Answer. I do not know that. He seemed to accuse those who were around him at the time. For instance, sometimes I recollect Mr. Meyer told me that he would ask him to protect him, and the next morning he would call him a murderer or something of that kind, claiming that he wanted to take his life. I was not present with him when he died. I was with him the day before, in the morning at 10 o'clock, and heard his last words—that is, what I thought were his last words, and I think they were. I am not certain. He only said that he was going to get up and go out. Captain Buddington said "you cannot do that; lie down," and he kept him quiet, and kept off all excitement from him. I did not like to see him suffering so. He was suffering very much that day. He was breathing very hard, and was in a half unconscious state. He was in a sort of stupor. I heard that he was so all day, and all that night until he died. He died in the morning about 3 o'clock.

Question. Did you ever have any idea that he died anything but a a natural death?

Answer. I never had any other idea. I did not have any other idea then, and have not now.

Question. Did he at any time, when he was apparently in his right mind, accuse any one of wanting to injure him?

Answer. No. He never did when he was in his right mind. He never said anything about anybody. I was present at the funeral. With regard to the medicine he received from the doctor, he asked me at the time what it was, knowing that I understood something about it. It was sulphite of iron that the doctor gave him one day for his stomach. He asked me what it was, and I told him how it was prepared, and everything about it. He asked me what a dose was, and I think I took twenty drops, so as to assure him that it was not at all dangerous. I took it right in front of him where he could see me do it. He was content, and took it after that. The doctor had ordered him to take only five drops. He asked me what a dose was, and I told him about twenty drops for a grown person; and I took the twenty drops to show him that I was not afraid to do it. After I took the twenty drops he was willing to take five. It has a kind of inky taste.

Question. Did you ever hear anybody express himself as relieved by Captain Hall's death?

Answer. No, sir; I think not. I do not recollect that anybody expressed themselves in that way. Nobody ever did in my hearing. I heard others say that they had heard such remarks, but I heard nothing of the kind.

Question. How was the discipline of the ship during Captain Hall's lifetime?

Answer. He was strict, but very good and kind to everybody. He commanded respect from everybody, and he paid every one his due respect. The discipline was good, so far as I know, during his lifetime. I do not know that there was much difference after his death. They never enforced the strict rules about putting the lights out, and things like that, after his death, but we just lived on as they do on board a whaler. Captain Buddington commanded respect for himself, and everybody paid him the respect that was due him, with the exception of some of the officers who thought probably they were a little higher, and had more right to exercise command.

Question. Did you keep Captain Hall's journal for him?

Answer. I did not keep his. I kept my own, and he always took his from mine; but he never wrote very much in his journal. He only wrote every few days. There was not much writing by him. During his disease he made me copy that which he had written.

Question. You spoke of this record at Cape Brevoort. Had he it copied off?

Answer. Yes; he had it copied off with pencil, and he dictated that to me, and I wrote it. I wrote it in the cabin on a piece of foolscap paper. I have seen the copy of the record in Captain Tyson's examination. It is a true copy. I myself wrote down a copy of it at the time. That was spoiled in some way or other; some ink got spilled on it, and I put it in my pocket, and kept it in my pocket until last winter. I had forgotten I had it in there. It was an old coat that I had put aside, and last winter I took the coat off, because I did not have anything else—any clothing. So I had to take that old coat, and in the pocket of it I found the old copy from Cape Brevoot. I intended to take it back, but I did not do it. I have since intended to bring it down here from New York, but having seen the same thing in Captain Tyson's examination, I thought it hardly worth while. He dictated to me from the original, which was in pencil. I put that dictation among his records, and they got lost. I had them all together, but that other piece of paper found in his writing desk was the original paper from which he dictated to me. He had brought that with him from Cape Brevoort. This dispatch, as published in the original report is correct. I took it before I left New York, and compared it with the copy I had. It is the very same.

Question. After Captain Hall's death what was done with these papers?

Answer. His papers were put in a large tin box. Captain Buddington gave them to me to put in there. I selected every one I could find to put it in. At the time we got separated from the other party I had these papers. I took care of them, because I wanted to save them. They were Captain Hall's papers, and I wanted to preserve them. I therefore put them out on the ice, and told the men to put them up on a high point that was there. I put them out myself. I do not know whether they were put on the high point or not; but I told them to put them there. Everybody was in such a hurry that probably nobody heard me speaking about it. I went out there myself afterwards, but I never got that far out, because I had to carry provisions from the ship to a point a little farther on, then another picked them up and took them still further.

Question. Was there any regular examination of these papers in having them sealed up after Captain Hall's death?

Answer. No, sir, no formal examination; there was no inventory

made of them. I do not know whether any of Captain Hall's papers were destroyed or not, but I do not believe that any one has been destroyed, because I never missed any; and I know what the papers were. No part of his journal was destroyed as far as I know. Everything was put away. After Captain Hall's death Captain Buddington took command, and I still acted as his clerk.

Question. What occurred after that of importance?

Answer. We broke adrift from our winter quarters, and went as far as Providence berg in a gale of wind. I do not think the ship was damaged at that time, but it is my opinion that she became damaged on the 27th of November, when that ice-berg moved in. I think she got crushed then. I cannot tell how much she was damaged at that time. Nobody could. We could not see so as to ascertain. She did not leak at that time because the water was all frozen. She got on to this iceberg and laid there all the rest of the winter. We got away in the following summer. I think it was on the 27th or the 29th of June.

Question. Were any more attempts made to go north during the winter while you laid there?

Answer. There was no attempt made because we had open water out in the straits, and we could not go over the land. Captain Hall proved that in his journey, and after his return, he so spoke. He said that we could not go over the land on account of the deep ravines, across it and the rocks. And he said there was no snow on the land in many places. He said, therefore, that he should try to reach the west coast, the following spring; and go up on the sleds, and go up farther. During the winter we had open water out in the straits and no ice, and therefore no attempt was made to go north, because we saw we could only reach it in boats. That is what we supposed, that we could only get north in boats. We had open water, even in April, and I think in May.

Question. In the middle of the straits?

Answer. Yes, sir; and up at Cape Lupton. It was close on to shore, and we could not get around the third cape north of us on account of the open water. There was no icefoot, and we could not travel over the ice on foot. In the spring two boat expeditions were sent to the north and they were gone some six weeks, and while they were gone we started with the Polaris three times to get north. We supposed the boats to be about Cape Union—what we called Cape Union. It is a little farther than Hayes' Cape Union from where the land turns north on the west coast. We found, however, that we could not get north with the Polaris. The ice was stretching across from Cape Sumner up to the west coast. The result was we never got north. Then those who started on the boat journeys returned without the boats. They could not get back with the boats. We then left Polaris Bay on our way south. I forgot to mention the expedition that was made down south during the winter on the sledges. Dr. Bessels and Mr. Bryan and the two Esquimaux composed the party that started on the expedition.

Question. When you got out with the Polaris to go south how was the ice then?

Answer. As far as I could see toward the north there was all ice, and when we got out there was so much ice outside of Polaris Bay that we thought she would not get through toward the south. We tried at several points to get through. We looked toward the north and we saw nothing but ice. We were satisfied the ship could not get north then. We had not much coal, and Captain Buddington did not think it advisable to go any farther. This was in August. The ice was not as open as it had been the previous year. We tried to make our way to the

southward then and got jammed in the ice. We first got beset opposite that island on the west coast. I do not recollect the name, but not far from Cape Constitution. That island has no name, I think. It is about in the middle of the straits, if I recollect aright, nearly opposite Cape Constitution. It is a little farther north. We drifted I think for about a day and night. During the night Captain Buddington tried to get through the ice. He started fires again and tried to get through, but did not succeed. The next day we got out into open water. There was a little open water to the south and we were able to steam ahead until we got fast into the ice again at the north end of Smith's Sound, near the south end of Kennedy's Channel. We remained fast, drifting south. We made several attempts to get out, but we could not go anywhere. The ice was closing in on us and we could not break out.

Question. What took place?

Answer. We drifted down a little south of Cape Alexander, and got a gale there. The ice broke off that night in a heavy gale from the south, and the vessel got jammed and got nipped, and we pitched everything on to the ice. That was the 15th of October. We had built a house on the ice before this.

Question. You were still fast to the same floe that you made fast to up in Smith's Straits?

Answer. I do not know whether it was the very same or not, because we changed our position several times. I do not think it was the very same one that we made fast to first. We tried several times to get out, and succeeded in going to the northwest, probably a mile or two, and then we had to make fast again, and could not get any farther. We made attempts to get out of the pack, but could not do it.

Question. What caused the ship to break adrift that night?

Answer. It was the gale that drove the ship off. The anchors came out. That is, the floe broke right where the anchors were planted in it.

Question. Were you all on deck when it broke adrift?

Answer. I was not on deck; I was in the cabin fixing up my box. I had two boxes of clothes that I had just put out, or rather gave Mr. Bryan to put out. When he came in I was just wrapping up some books—Captain Buddington's journal and my own. That is all I had.

Question. Did you hear Captain Buddington order the provisions and stores to be landed on the ice at that time?

Answer. He ordered the provisions to be landed. I think it was at seven or eight o'clock. It was pretty early in the evening. We did not break off until nearly ten o'clock. We had the boats out already, and were helping over things. I was out there when they put the boats farther out on the ice. Then I went aboard, and the next minute we drifted off. I went on board to get the books. I had everything else on the ice.

Question. Then the separation was accidental?

Answer. Yes; entirely so. A number of people were left on the ice, nineteen, I think, and all the boats and sleds. The ship drifted to the north; that is, she drifted until the next morning. When it became clear we found ourselves in a bay—in what we supposed to be a bay. It is above Littleton Island. During the night we had to pump the ship. Soon after the separation Mr. Schumann came up, and said that if he could not keep her free now, she would have to go down, because the water was above the platform and already in the fire-room, and nearly extinguishing the fire. He succeeded in keeping her free with the steam-pump. In the morning, when we found ourselves in this bay, we sailed in. We only used steam to round a certain point of ice.

We did not have coal enough to start steam; that is, to get enough steam for the propeller; only enough to pump her, and just to give a few revolutions of the propeller, so that we could round the point of ice. That we could not do with the sails alone.

Question. Did you see any of the ice-floe that you had been fast to?

Answer. No, sir. I looked for it from the deck, but could not see it. I looked all that morning when we went in, and that forenoon, and looked about noon, but saw nothing at all. I was told by several that there was a black point there that they supposed was the provisions, but that they could not see any men. They gave me a glass, but, although I have as good eyes as any one, I could not make out anything. I did not go to the mast-head. Those people that told me about the provisions were always seeing something when they wanted to see it. Mr. Chester went up to the mast-head, and was up there continually as far as I remember, with a glass. He saw nothing of them. He thought he saw some provisions, but nobody with them. Then we ran the ship ashore. The stem was broken off below the six-foot mark. I could not see anything of the lower part of the stem.

Question. Was her bow open then?

Answer. I never saw that the bow was open; I never saw it, because the ice was all around it, and frozen,

Question. Where did you suppose all the water came into her?

Answer. Forward, at the bows. I know the water got in there from hearing it down in the fore-peak.

Question. Have you been brought up as a seaman?

Answer. No; I have been a druggist. I passed my examination in New York, in the College of Pharmacy. I have not had a seaman's experience.

Question. Is it your opinion that it was necessary to run the ship ashore to keep her from sinking?

Answer. She was run ashore and remained ashore, and we left her there. We left her a few days afterward, and built a house. We felt that it was necessary to abandon the ship; that we would never get her out again. I thought so when we came down. In fact we knew that we could not get out of the ice and snow, that we did not have coal enough to steam; and I have been told that we could not proceed with the sails, and I do not think myself we could have from what I saw. We built a house and remained there during the winter. The Esquimaux came to us and assisted us. We were on friendly relations with them. They remained there, off and on, during winter. They built snow-houses and snow-huts around our house, and remained there in that way. Sometimes they went down to the settlement and remained there. Men and women and children, all together, were with us. And I think we had as many as 101 at different times.

Question. Were they there when you left the ship?

Answer. No; they came the next day. We thought it was the party whom we had left on the ice.

Question. When you left the ship in the following spring were they still there?

Answer. There were some—a few. There was one family that lived with us all winter—that was there—and another family that had come back fourteen days before that.

Question. You lived comfortably during the winter in the house?

Answer. I could not say we lived very comfortably, but we could not expect anything else under the circumstances.

Question. Comparatively comfortably?

Answer. Yes; in the spring we began to build boats, and in those boats we left for the South. It was the 2d of June that we left. We all left at the same time, taking with us what we could carry. We left behind us some potatoes, pork, and dried apples, and some bread. We did not have very much bread. We did not bury those provisions, but left them outside. We left in a hurry. Those provisions were canned.

Question. What did you do with the ship's log-books, and other papers?

Answer. Some of the log-books were buried. The old log-book was buried. Mr. Chester wrote a new one. He copied the old one into a smaller one, that it would be handier for carrying, and he took that along. The old log-book was buried, and the instruments also. Some of Captain Hall's books were also.

Question. How was the place marked where they were buried?

Answer. I have not been up there myself, and I do not know. After we started we were in the boats from the 2d of June until the 23d of June—about three weeks. We sometimes slept in the boats and sometimes on the rocks. It was very cold. The first time we had heavy snow. I recollect that when we were on Hakluyt Island we were covered with snow. We managed to keep warm by getting under the blankets and gathering moss together. We had a covering over the boats, but we did not sleep in the boats at that time. I do not know why, in fact, but the covering was not made up until we were on Hakluyt Island. We slept on the rocks, not on the ice. We kept close in to the the Island. Hakluyt Island is close to Northumberland Island. I should think it was about four miles from it. We went on until we got around Cape York, and were picked up by the Ravenscraig, by whom we were kindly taken care of. We were then transferred to the Intrepid and then to the Eric. We then reached Dundee, and from there came here. Mr. Bryan and Mr. Booth were with me. We all came together with the exception of Mr. Bryan, who remained there a week. He had a leave of absence.

Question. In your journal you say that you saw Northumberland Island before you broke loose?

Answer. Yes; I saw it on the 14th, when it was clear. We were a good deal south of Cape Alexander; I recollect that very well. The last point we saw on the west coast was Gale Point. That is the point we were nearly opposite then.

Question. How long was it after you saw Gale Point before you drifted down and saw Northumberland?

Answer. We saw Northumberland Island at the same time, when we were opposite Gale point.

Question. How high is Northumberland Island?

Answer. I think it is about 1,500 to 2,000 feet high.

Question. You had got to the south of Cape Alexander, and had seen Northumberland Island?

Answer. Yes, outside of Cape Alexander. There is one thing I want to say about the observations that were taken up there the first year by Mr. Myers. They were brought back with the records by the doctor, if I recollect right. I do not know whether you have the corrections for the barometers—the barometers that were used. I have some of the observations taken, but have not corrected them. I think you can get the corrections out of my observations. I can send them down here. I did not bring them along, because I did not think it was necessary until lately.

Question. What papers have you now that you kept of the expedition?

Answer. Nothing else I now know of except these two journals, and those observations—the barometrical and thermometrical.

(Mr. Mauch was desired to produce the observations referred to, and he promised to do so on his return to New York.)

Question. Do you remember the day when the Polaris was farthest north?

Answer. Yes. I was on deck.

Question. What did you see when she was the highest in latitude?

Answer. I saw she could not get any farther. There was ice ahead.

Question. What did you see on your right hand?

Answer. I did not see anything on my right hand, because it was foggy to the eastward. I think I saw land to the left. That was when she was up at 82° 16′. Occasionally we have seen land on the east coast when she was at the highest northern point.

Question. How high north did you go yourself?

Answer. I went as far as Cape Sumner—not quite.

(Mr. Mauch produces chronometer of the Polaris, numbered "1381," and having on it the names of "T. S. & J. D. Negus, New York.")

Question. This chronometer went out in the Polaris?

Answer. Yes.

Question. Has it been going ever since?

Answer. Yes.

Question. Had it stopped at all?

Answer. Yes, it stopped at one time in the boat journey. I think it did. It was not in our boat. The doctor had it.

Question. You mean in the last journey?

Answer. I have heard it stopped then. I am not certain about it.

Question. What became of the other chronometers?

Answer. They were left up there. That is the only one brought away, I think.

Question. Have you wound this up since yourself?

Answer. Yes. Mr. Bryan set it again, off Cape Kater, on the west coast.

Examination of John W. Booth.

I was born in Lancaster, England, in 1848. I am a machinist by trade. My first voyage to sea was made in the Polaris. I joined her in Brooklyn. I went in her from there to Greenland, stopping on the way at Saint John's, Fiskernaes, Holsteinburgh, Disco, Upernavik, Kingituk, and Tessuisak.

Question. Did anything of consequence happen on the way there?

Answer. There was only a little accident that happened to the engine. One of the nuts of the reversing link came off. That is all. The blow-off pipe gave out at Saint John's. Otherwise the engine worked well. From the last place I mentioned we went up north without much difficulty. We stopped at Cape Frazer, where Captain Hall went ashore. Then he came back, and we went on without much difficulty until we got stopped by the ice. That, I think, was the 4th of September. We were then in latitude 82° 26′. I was in the fire-room at the time. I was on deck a little while. I saw nothing but ice; no water to the north. I saw plenty of land on both sides, both east and west.

Question. Was that while you were in Robeson's Straits?

Answer. Yes.

Question. Was the engine in good condition then.

Answer. Yes; and we could have gone on had the ice permitted. We had from one hundred and ten to one hundred and twenty tons of coal. In coming along up Kennedy Channel and Smith's Sound, the propeller was making about sixty-five turns. Not being able to get any further north, after some little delay, we went into Polaris Bay for winter quarters, and secured the ship there. On the 10th of October, Captain Hall started off on a sledge journey, and returned on the 24th of the same month. I met him when he came back at the observatory. He said he was glad to see us all again, and he seemed to be in good health. He said he enjoyed his journey very much, though he was a little tired. He then went on board of the ship. From that day I did not see him any more until I went into the room when he was dead. I knew that he was sick.

Question. Did you at the time of his decease have any idea that he died from any other than natural causes?

Answer. No, sir. Even now I believe he died a natural death.

Question. What happened during the winter about your engine and your machinery?

Answer. We took her all down so as to put her together in the spring, and saw that everything was all right, ready for the next spring, to go north. I had that work to do while I was there, and was engaged in making things for Captain Hall's sledge journey.

Question. What did you do during the winter after you took the engine apart?

Answer. I did nothing specially. I occasionally helped the men if there was anything to do.

Question. Did Captain Buddington take command after Captain Hall's death?

Answer. Yes, sir.

Question. Was there any trouble during Captain Hall's lifetime on board the ship, that you know of?

Answer. None that I know of.

Question. Any after his death?

Answer. No, sir.

Question. How was the discipline of the ship while Captain Hall lived?

Answer. Excellent.

Question. How was it after his death?

Answer. Very good. I know of no serious difficulty on board. I had none with any person.

Question. How long did you remain in Polaris Bay?

Answer. We remained in Polaris Bay until the 12th day of August. I forget the day exactly that we went to the north, but it was some time in July, 1872—that is when we made the second attempt to get a passage up. We could not get any farther than the south point of Newman's Bay, on account of the ice. That was while the two parties were away on their boat journeys. We made a third attempt, but failed, and then we lay in Polaris Bay until the 12th of August, when we turned to the southward. The boat parties had not at that time returned. We had sent for them. One crew arrived just a few days before we started away.

Question. Could you have gone north at that time with the ship?

Answer. No, sir. There was too much ice in Robeson's Straits. Nor could we have gone north at any time after that. When we got into the ice we drifted to the southward, and could not push our way

up north. We drifted to latitude 78°, the lowest point, I believe. We were then fast to the ice-floe with hawsers and anchors, while drifting down.

On the 14th of October, in the evening, the storm commenced, and the first thing I knew, while I was working in the fire-room, I heard a crash, and the ship reeled over and almost capsized. I was called on deck, and when I got there was ordered to the pump. We had no steam on at that time, and had had none for three days. The small pump was worked. After being sent to the pump I was called back again and ordered to get the things out of the forecastle, and throw them on the ice, as the ship was in bad condition. Captain Buddington ordered me to do so. While doing that he sent me away back to the pump and there I staid until the ship was away from the floe. She had been leaking a good deal for two or three days before. We were at first using a little steam-pump that we had there to keep the water out, but that broke down, and while I was repairing it they used the little hand-pump. At the time she knocked against this berg, and reeled over, she leaked worse than she did before.

Question. While you laid up in Polaris Bay did the ship take any damage there from the ice that would have been likely to have made her leak?

Answer. While she was lying on that berg her stem gave way. She cracked and there was a very bad place made in the bow, which we found out on the 23d of June. We could not find it out before on account of the water coming in and freezing over. When the ice melted away in the spring, we found out that she was leaking. Before, we did not know that she had received any damage. When the leak was discovered I was asked if I could take off the plate at her stem by the water-line six-foot mark, as she then was so much out of the water. I said "Yes," and took it off, and found one of the seams of the plank had given way. We put a lead patch over the cracked portion, and then I put the plate on.

Question. Was the stem cracked?

Answer. Yes. On the port side there was a place that we could not get at on account of the water. That we could not fix and never did fix. I drove in some oakum, but could not get enough in to stop it altogether.

Question. She had been leaking then while you were drifting down the ice?

Answer. Yes; but she leaked much worse after we got that nip.

Question. Did you go out on the ice that evening when you were passing things out?

Answer. No. I was ordered to the pump and there I remained. Then I was ordered the second time; I remained there until I was ordered to go down and get up steam. On the 15th we broke adrift, leaving a good many of our people on the ice. Of course the vessel's breaking adrift was purely accidental.

Question. At night what did you do?

Answer. I was getting up steam, and pumping out the ship. That is what I was doing at the time. I was not on deck then. I could not get up there. We got up steam to pump, and the next morning I was on deck at 5 o'clock, and saw where we were—at Lifeboat Cove, above Littleton's Island. We were near the land on the east coast. The weather was then very clear; the wind had ceased, and the water was smooth. It was in a kind of bay—a bight in the land. We worked the vessel in with steam and sails, pumping all the while to keep the water down. We did this until we got her on the beach. We did not have a chance to see where or what the leak was when we got her on the beach.

We were satisfied that we could not put to sea in her again. If we had had plenty of coal we might have worked her out until we got down to Disco, Holsteinberg, or somewhere, where we could beach her higher than she was. When we went ashore we made up our minds it would be necessary to abandon her. We made up our minds that that was the last of her, and we would have to escape by other means. We then went to work to build a house, and lived there all winter. The next spring we built the boats. Mr. Chester, Mr. Coffin, and myself built the boats out of the roof of the cabin. The bottoms of the boats we made from the bunk-boards of the ship; all the rest was built from the roof of the cabin. They were flat-bottom boats. When the ice opened, on the 3d of June, we left Lifeboat Cove in these two boats, and started down to Sorfalik, where we made our first landing. We tried to get past a cape, but could not for the ice. We then had to put back to Sorfalik, a place that the natives call Etah Watana. We were in the boats about three weeks when we were picked up by the Ravenscraig. The Ravenscraig people were all very kind to us, and very glad to see us. From the Ravenscraig I was put on board the Intrepid on the 17th of July. I staid on board the Intrepid until the 23d of September. I was then transferred to the Eric, and by the Eric we were taken to Dundee. We reached Dundee on the 15th or 16th day of October. We remained there three days, and then went to Glasgow, and then sailed from Glasgow to New York, where we arrived November 6th, and I reported to the Brooklyn navy-yard, all the while that I was in Brooklyn.

Question. How were the engines and boilers when you beached the ship?

Answer. In first-class order. The engine was working better when we beached her than she ever was before.

Question. So that the steam department was in good order when you were compelled to run ashore?

Answer. Yes, sir.

Question. What did you think of the Polaris as a strong ship?

Answer. She was a very strong ship, and fit in every respect for the purpose of an Arctic voyage. She stood some pretty hard thumping, and if she had not been as strong a ship as she was, she would have gone down on the 4th of September.

Question. You never suffered for want of food on board the Polaris?

Answer. No, sir; nor anything else. The ship was well provided for an Arctic voyage.

Question. How long have you been in this country?

Answer. I have been eleven years in this country. I came here before I was of age. My home is in Brooklyn, New York. I am an American citizen.

Question. After Captain Hall's death, did you hear anybody say that he was glad he had died?

Answer. No, sir; every one I spoke to, always spoke very highly of Captain Hall, and were very sorry anything had happened to him.

Question. Did you use anything else to make steam with, but coal, while you were gone?

Answer. Only that night when we lost the men. We were compelled to get up steam in a hurry, and we had to use rosin and tar that we had on board; and wood and coal also.

Question. You had an apparatus on board to burn blubber with when you left New York?

Answer. Yes, sir; but we never used it. It was never used after it was used in Brooklyn. That was before I went on board of her; but I helped to put it together for them.

43D CONGRESS, 1st Session. } HOUSE OF REPRESENTATIVES. { Ex. DOC. 1, Part 4.

REPORT

OF THE

THE POSTMASTER GENERAL,

BEING PART OF

THE MESSAGE AND DOCUMENTS

COMMUNICATED TO THE

TWO HOUSES OF CONGRESS

AT THE

BEGINNING OF THE FIRST SESSION OF THE FORTY-THIRD CONGRESS.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1873.

REPORT

OF

THE POSTMASTER-GENERAL.

POST-OFFICE DEPARTMENT,
Washington, D. C., November 14, 1873.

SIR: The ordinary revenues of this Department for the fiscal year ended June 30, 1873, were $22,996,741.57, and the expenditures of all kinds $29,084,945.67. For the year ended June 30, 1872, the ordinary revenues were $21,915,426.37, and the expenditures $26,658,192.31. In 1873 there was an increase of revenue over 1872 of $1,081,315.20, or 4.93 per cent., and an increase of expenditures of $2,426,753.36, or 9.10 per cent. A comparison of 1873 with 1871 shows an increase in revenues of $2,959,696.15, or 14.42 per cent., and an increase of expenditures of $4,694,841.59, or 19.24 per cent. The increase or decrease in each item of receipt and expenditure during the fiscal year ended June 30, 1873, as compared with the years ended June 30, 1872, and June 30, 1871, respectively, is shown by table No. 2, accompanying the report of the Third Assistant Postmaster-General.

If, in addition to the ordinary revenues, the Department is credited with the amounts drawn and expended for subsidies to mail steamship-lines, ($725,000,) it will be seen that the amount drawn from the general Treasury under the appropriations to meet deficiencies during the year was $5,265,475, against $3,317,765.94 in 1872. To the deficiency for 1872, however, are to be added the standing appropriations for free matter amounting to $700,000, which have since been repealed.

The estimated expenditures for the year ending June 30, 1875, are....		$33,929,912 00
The ordinary revenues, estimated at 13 per cent. over 1873.....	$25,908,817 00	
Estimated revenue from money-order business.....	100,000 00	
Estimated revenue from postal-cards.....	1,034,732 00	
Estimated revenue from postage-stamps supplied to Departments.....	2,250,000 00	
Making the total estimated revenues for 1875.....		29,293,549 00
Leaving a deficiency to be appropriated out of the general Treasury of.		4,636,363 00

The foregoing estimates do not include the following special appropriations in the nature of subsidies:

For mail steamship-service between San Francisco and Japan and China, under acts approved February 17, 1865, and February 18, 1867.....	$500,000 00
For additional subsidy under act approved June 1, 1872.....	500,000 00
For mail steamship-service between the United States and Brazil, under act of May 28, 1864.....	150,000 00

For mail steamship-service between San Francisco and the Sandwich Islands, under act of March 2, 1867		$75,000 00
Total		1,225,000 00

Of the appropriations for deficiencies there were unexpended on June 30, 1872, the following amounts, viz:

For the fiscal year 1869–'70	$1,000,000 00	
For the fiscal year 1870–'71	2,618,396 00	
For the fiscal year 1871–'72	885,633 00	
		$4,504,029 00
Amount appropriated for the fiscal year 1872–'73		5,700,970 00
A total of		10,204,999 00

There were drawn during the last fiscal year, on account of payment, for previous fiscal years, the following:

Of the amount appropriated for 1869–'70	$152,225 00	
Of the amount appropriated for 1870–'71	978,000 00	
Of the amount appropriated for 1871–'72	535,000 00	
Of the amount appropriated for 1872–'73	3,600,250 00	
		5,265,475 00
Leaving the amount of appropriations for deficiencies undrawn and available for payments of indebtedness to June 30, 1873		4,939,524 00

Against this sum there are chargeable sundry unliquidated accounts estimated as follows:

For balances to foreign countries	$116,200 00	
For mail-service under contract and recognized, but not yet reported	393,643 00	
For mail-service still unrecognized	157,000 00	
		666,843 00
Leaving, after settlement of all liabilities to June 30, 1873, a net balance of deficiency-appropriations of		4,272,681 00

The number of adhesive postage-stamps issued during the year was 601,931,520, representing	$16,681,189 00
Stamped-envelopes, plain, 65,014,600, representing	1,722,512 00
Stamped-envelopes, "request," 52,201,250, representing	1,544,567 50
Newspaper-wrappers, 13,956,750, representing	140,567 50
Postal-cards, 31,094,000, representing	310,940 00
The whole number of stamps, stamped-envelopes, newspaper-wrappers, and postal-cards was 764,198,120, of the value of	20,399,776 00

The increase in the issue of stamps, stamped-envelopes, newspaper-wrappers, and postal-cards is exhibited by the following table:

Description.	Fiscal year ended June 30, 1873.	Fiscal year ended June 30, 1872.	Increase, amount.	Increase, per cent.
Adhesive postage-stamps	$16,681,189 00	$15,840,649 00	$840,540 00	5.31
Stamped-envelopes, plain	1,722,512 00	1,663,196 50	59,315 50	3.56
Stamped-envelopes, requests	1,544,567 50	1,391,630 00	152,937 50	10.99
Newspaper-wrappers	140,567 50	175,152 50	*34,585 00	*19.75
Postal-cards	310,940 00	.....	310,940 00	.....
Aggregate	20,399,776 00	19,070,628 00	1,329,148 00	6.97

* Decrease.

The number of packages of postage-stamps lost in the mails during the year was three, representing $59, and of stamped envelopes one, representing $8.45, and of postal cards none; being the smallest losses ever incurred during any year. This is undoubtedly owing to the fact that all packages of postage-stamps, stamped-envelopes, newspaper-wrappers, and postal-cards are registered, and illustrates in a most effective manner the security of the registry system.

CONTRACTS.

There were in the service of the Department, on the 30th of June, 1873, 5,930 contractors for the transportation of the mails on public routes.

There were, at the close of the year, 2,359 "special" offices, each with a mail-carrier, whose pay from the Department is not allowed to exceed the net postal yield of the office.

Of public mail-routes in operation there were 7,424, aggregating in length 256,210 miles; in annual transportation, 119,909,650 miles; and in annual cost, $13,635,341. Adding the compensation of railway post-office clerks, route-agents, mail-route messengers, local agents, mail-messengers, and baggage-masters in charge of registered packages, amounting to $2,525,693, the aggregate annual cost was $16,161,034.

The service was divided as follows:

Railroad routes: Length, 63,457 miles; annual transportation, 65,-621,445 miles; annual cost, $7,257,196—about 11.06 cents per mile.

Steamboat routes: Length, 16,762 miles; annual transportation, 3,947,785 miles; annual cost, $799,645—about 20.25 cents per mile.

Other routes, upon which the mails are required to be conveyed with "celerity, certainty, and security:" Length, 175,991 miles; annual transportation, 50,340,420 miles; annual cost, $5,578,500—about 11.08 cents per mile.

There was an increase over the preceding year in length of routes of 4,812 miles; in annual transportation, 4,925,328 miles; and in cost, $1,063,077. Adding the increased cost for railway post-office clerks, route, local, and other agents, $318,749, the total increase in cost was $1,381,826.

The railroad routes have been increased in length 5,546 miles, and in cost $754,425, against an increase last year of 8,077 miles in length and $777,792 in cost.

RE-ADJUSTMENT OF PAY ON RAILROAD ROUTES.

About the 1st of February, 1873, circulars were sent out from the Department to the proprietors of railroad routes in the States of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, and New York, calling for returns of the amount and character of the mail-service they performed, with a view to the re-adjustment of their pay for the new contract term commencing 1st of July, 1873. The re.

sults are shown in Table E, which contains returns, also, as usual, from routes in other States. The passage of the act approved March 3, 1873, providing for a general re-adjustment of pay on railroad routes upon a showing of the state of the service to be furnished for a period subsequent to June 30, 1873, prevented the use of the returns made under the call of 1st of February, 1873, as data for determining the compensation for the new contract term in the States above named; and, in conformity with the requirements of the new law, the proprietors of all the railroad routes in the country have been called upon to submit new returns for thirty days, commencing 1st of October, 1873, this month being supposed to afford a fair average for the year. The re-adjustment to be predicated upon these new returns, (which are not yet at hand,) will take effect from the commencement of the current fiscal year. Payments have been made for the quarter ended 30th of September, 1873, but with the understanding that they are hereafter to be modified, if necessary, to agree with the character of the new returns. Table F exhibits the re-adjustment of the rates on 52 routes, and the adjustment of rates on 21 new routes, ordered within the year ended 30th of September, 1873, to take effect prior to the close of the last fiscal year. The rates were increased, it will be seen, on 44 routes and decreased on 8, the net increase in the amount of annual pay being $223,823.55. The 21 new routes included in the table are only a portion of the new routes put in operation, temporary rates, not exceeding the maximum fixed by law for routes of the lowest class, being allowed on the residue in the absence of the usual returns. The number of new railroad routes put in operation during the year ended June 30, 1873, was 61.

POST-ROUTE MAPS.

The work of the topographer has been continued and extended, with good results to all branches of the public service. A large map, in four sheets, on a scale of ten miles to the inch, of the States of Illinois, Missouri, and Iowa, with adjacent parts of Wisconsin, Minnesota, Nebraska, and Kansas, has been finished during the year, and many copies printed and distributed. The increasing demand, already beyond the capacity of the Department to satisfy, for this and the other maps previously published, and the many encomiums bestowed upon them for accuracy, clearness, and neatness of execution, attest the high esteem in which they are held.

FINES AND DEDUCTIONS.

The amount of fines imposed upon contractors and deductions made from their pay for failures and other delinquencies, for the year, was $75,277.53; and the amount remitted during the same period was $8,617.08; leaving the net amount of fines and deductions $66,660.45.

MAIL-BAGS, LOCKS, AND KEYS.

A table appended to this report exhibits in detail the number, description, and cost of mail-bags and mail-catchers, and of mail-locks and keys, purchased under contracts, during the last year. Of locked mail-bags, (used for letters,) there were 8,600; of tied mail-bags, (used for printed matter,) there were 86,650; and of mail-catchers, (used for exchanging mails with postal cars under full speed,) there were 300. The total cost of bags and catchers was $94,828.40. The total cost of mail-locks and keys, including repairs, was $28,018.76.

THROUGH MAILS.

The through-mail tables appended hereto exhibit an improvement in the service between New York and San Francisco, the average time westward, during the year ended 30th September, 1873, being 179 hours 4 minutes, a little less than seven and a half days, against 216 hours 23 minutes, or more than nine days, the preceding year; and the average time eastward, 174 hours 59 minutes, a little over seven and a quarter days, against 197 hours 45 minutes, or nearly eight and a quarter days, the preceding year. Between Washington and New Orleans the average time was about four hours more going south, and about three hours less going north, than during the preceding year, the time south being 81 hours 45 minutes, against 77 hours 39 minutes the preceding year, and the time north 72 hours 53 minutes, against 75 hours 38 minutes the preceding year. The usual full details will be found in the tables of the service on the lines running westward from Washington and New York to Cincinnati, Saint Louis, and Chicago.

MAIL DEPREDATIONS.

The number of recorded complaints for the past year of missing letters was 6,165, of which 3,980 were unregistered and 2,185 registered, containing in the former, as reported, in bonds, drafts, and currency, $309,123.53, and in the latter $70,421.91. Of the registered letters, 899 were accounted for, 313 are reported as actually lost, and 973 are still in the hands of special agents for investigation. During the year 302 persons were arrested for various offenses against the postal laws and regulations. Of these, 94 have been convicted, 20 have been acquitted, 193 are awaiting trial, and 95 have been discharged for want of proof sufficient to insure conviction. It is amazing that so many persons will persist in sending money through the mails, thereby subjecting themselves and the public to risk, and tempting the weak to dishonesty and ruin, when the Department provides the means of safe transmission by money-orders at an insignificant cost. Some of the most experienced officers in the service are of the opinion that Congress should adopt such legislation as will prevent the use of the mails for the conveyance of money in letters, and compel the registration of every valuable package.

RAILWAY POST-OFFICES.

A tabular statement hereto appended shows that the number of railway post-office lines in operation on the 30th of June, 1873, was 59, extending over 14,866 miles of railroad and steamboat routes—an increase of 2 lines and 749 miles over the preceding year. The number of clerks employed was 752, at an annual cost of $941,000—an increase of 103 clerks and $119,400. Upon 12,312 miles the service is performed daily; upon 2,533 miles twice daily, and upon 21 miles four times daily, equivalent in all to 17,462 miles each way daily. Counting all the lines both ways, the aggregate service is 34,925 miles daily.

FOREIGN MAILS.

The total number of letters exchanged during the year with foreign countries was 27,459,185, an increase of 3,096,685 over the number reported for 1872. Of this number, 14,332,674 were sent from and 13,126,511 were received in the United States.

The number of letters (single rates) exchanged in the United States and European mails was 19,585,514, an increase of 1,902,515 over the number reported for 1872.

The total postages on the letters exchanged with foreign countries amounted to $2,021,310.86, an increase of $150,053.61 over the amount reported for 1872.

The aggregate amount of postage (sea, inland, and foreign) on the letter-mails exchanged with the United Kingdom of Great Britain and Ireland, Germany, France, Belgium, the Netherlands, Switzerland, Italy, Denmark, Sweden, Norway, and Spain, was $1,406,507.50, an increase of $102,653.45 over the amount reported for 1872. The postages on letters *sent* exceeded the postages on letters *received* from the same countries, in the sum of $22,934.58, being 1.63 per cent. of the aggregate amount. The postages collected in the United States amounted to $865,511.47, and in Europe to $540,996.03; the excess of collections in the United States being $324,515.44, or 23 per cent. of the entire postage receipts on European correspondence.

Comparing the year 1873 with the year 1872, the rate of increase in the total number of letters exchanged with foreign countries was 12.7 per cent., and the rate of increase in the amount of postages thereon was 8 per cent. The increase in the number of letters exchanged with European countries was $10\frac{3}{4}$ per cent., and the increase of postages thereon amounted to $7\frac{7}{8}$ per cent.

The total weight of mails exchanged during the year with European countries was 1,825,397 pounds, (over 912 tons,) an increase of 184,708 pounds, or 92 tons, compared with the previous year. The weight of letter-correspondence was 397,339 pounds, and of printed matter and samples, 1,428,058 pounds. The aggregate weight of mails *sent* to Europe was 899,580 pounds, and of mails *received* from Europe 925,817 pounds. The

weight of letter-correspondence *sent* to Europe was 211,616½ pounds, and of letter-correspondence *received* from Europe 185,722½ pounds. The weight of printed matter and samples *sent* to Europe was 687,964 pounds, and of printed matter and samples *received* from Europe 740,094 pounds.

The cost of the United States transatlantic mail steamship service for the year 1873 was $226,745.77, being an increase of $6,440.07 over the cost of the same service for the year 1872. The payments made to the respective steamship lines conveying mails to Europe, receiving the sea-postages as full compensation for the service, were as follows, viz:

The Liverpool and Great Western, (Williams and Guion line,) for 51 trips from New York to Queenstown	$79,294 42
The Hamburg-American Packet Company, for 52 trips from New York to Plymouth and Hamburg, and four trips from New Orleans to France, Spain, and Hamburg	57,958 88
The North German Lloyd of Bremen, for 77 trips from New York to Southampton and Bremen, and also for conveying mails from Baltimore and New Orleans to Bremen	33,573 74
The White Star line, for 33 trips from New York to Queenstown	29,831 97
The Inman line, for 16 trips from New York to Queenstown	14,641 70
The Canadian line, for 52 trips to Liverpool	6,065 13
The Cunard line, for 55 trips from Boston to Liverpool	4,977 37
The National line, for 2 trips from New York	390 49
The Baltic Lloyd line for 1 trip from New York to Stettin	12 07
Total	226,745 77

The United States postages on mails conveyed to and from the West Indies, Panama, and Central America, Brazil, Mexico, Bermuda, Nova Scotia, New Granada, and New Zealand, amounted to $137,517.68, and the cost of the sea conveyance thereof was $95,525.58. The United States postages on mails exchanged with Brazil, Japan, and China, the Sandwich Islands, New Zealand, and Australia, by means of the subsidized lines of direct mail-steamers, amounted to $49,829.38. The total cost of the United States ocean mail steamship service for the year 1873, (including $725,000 paid from special appropriation for steamship service to Japan and China, to Brazil, and to the Hawaiian Islands,) was $1,047,271.35.

A new contract has been executed with the Pacific Mail Steamship Company, for the additional monthly mail between San Franciso and Hong-Kong, (China,) via Yokohama, (Japan,) authorized by sections 3 and 6 of the act of Congress approved June 1, 1872, which discharges and releases from future responsibility the sureties for said company under the original contract, executed the 29th of August, 1872, and substituted new sureties in their stead. A copy thereof is hereto annexed.

The additional service authorized by the law of June 1, 1872, should have been commenced on the 1st of October, 1873, by American-built iron steamships of not less than 4,000 tons register. The company has, however, failed to comply with its contract, because, as is allege·!,

of unexpected difficulties, which retarded the building of the new steamships now being constructed for this service.

The company has submitted a statement of the causes of its failure to place the new ships on the line on the 1st of October last, by which it appears that immediately after the passage of the act of Congress authorizing the additional monthly mail on this route, a contract was made for the construction of two iron screw-steamers of upwards of 4,000 tons register, the hulls of which are now nearly completed, and that the first of these ships will be launched early in December next.

In the month of May, 1872, the Pacific Mail Steamship Company commenced an additional monthly mail service between San Francisco and Japan and China, which has been maintained regularly, with three exceptions, to the present date; for which service the sea-postages on the mails transported have been allowed as full compensation, under the provisions of the general law fixing the rates of compensation for the sea-conveyance of mails; so that a regular semi-monthly mail service is now being performed on the line, although by steamers of less tonnage than that required for the additional monthly service. The company has requested that it may be permitted to continue the service as at present, until it can place the new ships of the required tonnage on the line. It is, doubtless, doing all it can, with its present resources, to comply, in good faith, with the requirements of the contract at an early day; but, as this service was specially authorized by act of Congress, upon certain prescribed terms and limitations, and the success or failure of the enterprise is a question fraught with important national interests, I have not felt at liberty either to annul the contract for the additional monthly service on account of the failure to commence the same on the day fixed by law, or to give any permission or assurance for a continuance of the contract and service as requested by the company. No good reason is, however, perceived why the company should not be permitted to continue the service as at present, until the new ships are completed and placed upon the line, with the understanding that it shall make no claim upon the additional subsidy, or any part thereof, but shall receive the sea-postage only, as heretofore, in full compensation for the additional service, until the contract shall be fully complied with.

Notice was given to this department on the 4th of March, 1873, by the United States, New Zealand and Australia Mail Steamship Company of the withdrawal of its steamers from the route between San Francisco, New Zealand, and the Australian Colonies, via the Sandwich Islands, the effort of said company to establish an American line of mail-steamships on that route having proved unsuccessful.

A postal convention has been concluded with the United Kingdoms of Sweden and Norway, establishing and regulating a direct exchange of correspondence with those kingdoms, at reduced postage charges.

This convention, a copy of which is appended, was carried into operation on the 1st of July, 1873.

A second additional postal convention has been concluded with Belgium, (a copy of which is appended,) reducing, on and after July 1, 1873, the single rate of letter postage from 10 to 8 cents, by closed mail via England, and to 6 cents by direct steamers.

An exchange of postal cards with Canada, and also with Newfoundland, has been established on the basis of a prepaid postage of 2 cents in full to destination in either direction, prepayment thereof to be made by affixing to the card an ordinary 1-cent postage-stamp of the country of origin in addition to the stamp printed or impressed thereon. Copies of the additional articles providing therefor are appended.

A similar arrangement has been concluded with the post-department of North Germany for the mutual exchange of United States and German postal cards, on prepayment of a postage of 2 cents on cards from the United States for Germany, and of one silber groschen on cards from Germany for the United States. The additional articles providing for such exchange are hereto appended.

A proposition to the British office for a like arrangement for an exchange of United States and British postal cards, has been declined by that office.

A postal convention, establishing and regulating an exchange of correspondence between the United States and the empire of Japan, by means of direct lines of steamships plying between the sea-ports of the two countries, has been formally agreed upon and executed with the chargé d'affaires of Japan at Washington, and is to be carried into effect six months after its ratification by the government of Japan.

The basis of a postal convention with France was agreed upon at Paris, in the mouth of October last, between Mr. Washburne, our minister to France, and the director-general of the French post-office, which fixed the single rate of international postage for letters at 8 cents (40 centimes) per each 10 grams or fraction thereof, to be divided equally between the two countries. The articles of this basis were transmitted to me for consideration, but before any action was taken upon them, the negotiations were transferred to Washington, and renewed through the Marquis de Noailles, envoy extraordinary and minister plenipotentiary of France, for the avowed object of obtaining such an increase of letter-postage as would guarantee to France her full interior letter rate of 20 centimes. The proposition to increase the single rate of letter-postage from 40 to 50 centimes, and other changes of the basis agreed upon at Paris relating to the standard weight for letters and a just division of the expenses of intermediate sea-transportation, were fully considered at several interviews had with the Marquis de Noailles, but without result. I objected to increasing the letter-postage, because of my earnest desire to establish a letter rate approximating in some degree to the much cheaper rates established

between the United States and Great Britain, Germany, and other leading countries of Europe. I was also unwilling to accept the French domestic letter standard of 10 grams, because, being exceptional, and differing from our domestic standard of one-half ounce, which is also used in rating postage on letters exchanged with all other countries, it could not be applied at our post-offices without serious embarrassment and difficulty, resulting from mistakes in collecting the proper amount of postage, and consequent additional charges at destination. At length, finding it impossible to conclude a satisfactory arrangement on the ordinary plan of optional prepayment of postage, and wishing to divest the subject of the perplexing questions of disagreement, I submitted the simple proposition for a postal convention on the plan of "compulsory prepayment, with no accounts," the main features of which were: An international letter-postage of 9 cents, and the nearest equivalent thereof in French money; prepayment obligatory, the mailing country to retain to its own use all the postage it collects, and the receiving country to deliver at destination free of charge; each country to levy and collect postage by the standard weight adopted for its domestic mails, and to defray the expenses of intermediate transportation of the mails sent to the other. In submitting this proposition, this Department yielded to France an increase of the rate of letter-postage and the advantage of rating and collecting her postage by the smaller standard of weight; and nothing can be urged against its adoption except the demand that this country shall use the exceptional French standard for rating letters. It has been submitted by the French minister to his government for instructions, and I trust it will be accepted, as it concedes all that, in my judgment, this Department can concede to effect a settlement of the vexed questions in controversy, a due regard being had to the interests and convenience of the American people.

APPOINTMENTS.

The report of the appointment-office shows the following:

Number of post-offices established during the year	2,462
Number discontinued	1,081
Increase	1,381
Number in operation on June 30, 1872	31,863
Number in operation on June 30, 1873	33,244
Number filled by appointments of the President	1,363
Number filled by appointments of the Postmaster-General	31,881

Appointments were made during the year—

On resignations	4,802
On removals	945
On changes of names and sites	193
On deaths of postmasters	386
On establishment of new post-offices	2,462
Total appointments	8,788
Number of cases acted on during the year	10,101

The number and aggregate compensation of special agents, route-agents, mail-route messengers, railway post-office clerks, and local agents in service during the year ended June 30, 1873, were—

47	special agents*	$155,033
752	railway post-office clerks	941,000
862	route-agents	828,240
171	mail-route messengers	106,740
110	local agents	82,896
1,942	Total	2,113,909

The free-delivery system has been in operation during the year in fifty-two of the principal cities, with the following aggregate results:

Number of letter-carriers	1,499
Mail-letters delivered	140,958,887
Local letters delivered	38,340,049
Newspapers delivered	43,390,665
Letters collected	137,065,699
Newspapers collected	15,560,373
Whole number of pieces handled	374,915,664
Amount paid carriers, including incidental expenses	$1,422,495.48
Average cost per piece	3.8 mills.
Amount of postage on local matter	$1,112,251 21

Showing the following increase compared with last year:

Letter-carriers	56
Mail-letters delivered	13,860,059
Local letters delivered	5,336,169
Letters collected	6,763,297
Amount paid carriers, including incidental expenses	$33,597.87
Postage on local matter	$204,899.28
Percentage of increase of receipts on local postage	.225
Percentage of increase in cost of service	.0263

With this report ends the first decade of the free-delivery service in this country. The grounds mainly relied upon for its establishment and extension, namely, public convenience and the stimulus to correspondence, have been fully verified by experience thus far. This system, with its letter-boxes located at convenient points throughout the large postal centers, and its frequent deliveries and collections of mail-matter by carriers, has proved to be a virtual extension of the post-office to every house. The transaction of the postal business of large communities by a few men selected for the purpose is justified, in an economic point of view, by the time saved to the people, the reduction of labor in post-offices, the facilities and stimulus given to correspondence, the frequency, promptness, and accuracy secured in the delivery of letters, and the reduction of the number of advertised and dead letters. While these benefits are most strikingly seen in the larger cities, they are felt and appreciated in all places where the frequency of the mails, the density of the population, and the distance from the

* Other special agents charged to separate appropriations.

office make it inconvenient for citizens to call or send for their mail. The average of population to each carrier varies with the number of people to be served, the extent of territory, and the frequency of the deliveries. The general average, however, is estimated at 3,690. The expense of the system at each office is paid out of the revenue of that office. It seems but fair, therefore, that this mode of delivery should be extended to all cities where the population, business, extent of territory, and frequency of the mails may authorize the requisite force and outlay. Just how far these elements may combine to warrant the extension of the system, it is difficult to determine; but I am of the opinion that it might be advantageously provided for cities having in their corporate limits a population of not less than ten thousand.

The following table shows the number of employés in the Post-Office Department; also the number of postmasters, contractors, clerks in post-offices, route-agents, railway post-office clerks, and other officers in service on the 30th June, 1872, and the 30th June, 1873, respectively:

Departmental officers and employés:

1872.		1873.
1	Postmaster-General	1
3	Assistant Postmasters-General	3
1	Superintendent of Foreign Mails	1
1	Superintendent of Money-Order System	1
1	chief of division of dead letters	1
1	chief clerk of Department	1
4	chief clerks of bureaus	4
334	clerks, laborers, watchmen, &c	342
346		354

Other officers and agents:

31,863	postmasters	33,244
5,544	contractors	5,930
3,754	clerks in post-offices	4,025
1,442	letter-carriers	1,499
764	route-agents	862
642	railway post-office clerks	752
146	mail-route messengers	171
95	local agents	110
59	special agents	63
44,655	Total in service	47,010

DEAD LETTERS.

The operations of the Dead-Letter Office are fully given in a tabular statement printed in the appendix, and may be epitomized as follows:

Number of domestic letters received, 4,133,928; number of foreign letters, 268,420; total, 4,402,348, representing an actual or nominal value of $5,795,764.11. Of this number 1,826,108, representing $5,377,923.27, were delivered to owners or writers; 31,388, representing $132,993.33, which could not be delivered, were filed for reclama-

tion; 11,370 remained either on hand not acted upon, or were outstanding in the hands of postmasters for delivery June 30, 1873, and representing $284,847.51; and 2,533,482, which either could not be delivered, or from various causes were worthless, were destroyed.

The number of applications for dead letters was 6,598, and in 2,075 cases the letters were found and forwarded to applicants or owners.

The amounts received during the year and deposited in the Treasury were—

From unclaimed dead letters		$6,208 00
From proceeds of sales of waste paper	$3,401 55	
From proceeds of sales of post-route maps	502 40	
From proceeds of sales of old carpets	293 56	
		4,143 51
Total deposited during the year		10,351 51

POSTAL MONEY-ORDER SYSTEM.

The number of money-order post-offices in operation during the last fiscal year was 2,775. On the 7th of July, 1873, 299 additional offices were established, and 5 were discontinued, making the whole number at present 3,069. Of the additional offices, seven were opened at sub-post-offices or stations in large cities, viz: one in Boston, one in Chicago, and five in Philadelphia.

The number of domestic money-orders issued during the year was 3,355,686, the aggregate value of which was		$57,516,216 69
The number of such orders paid was 3,314,818, amounting in value to	$56,900,351 23	
To which is to be added the amount of orders repaid to the remitters	394,661 04	
Total of payments		57,295,012 27
Excess of issues over payments		221,204 42

The amount of fees paid by the public to postmasters for the issue of money-orders was $354,602.25. These transactions show an increase over those of 1872 of $9,000,683.97, or 18.55 per cent., in the amount of orders issued; of $8,875,367.30, or 18.33 per cent., in the amount of orders paid; and of $4,316.59, or 1.23 per cent., in the amount of fees received. The average amount of the money-orders issued during the last year was $17.14, being $1.71 less than the average of the preceding year. The small increase in the fees received, as compared with the issues and payments of orders, is owing to the reduction, by the act of June 8, 1872, of the fee for orders not exceeding $10 from 10 cents to 5 cents. The diminution of the average amount of the order is to be attributed to the same cause, which stimulated the purchase of small orders issued at one-half the rate formerly charged.

Duplicate money-orders to the number of 14,521 were issued by the Department during the year, of which 14,256 were in lieu of original

orders which failed to reach the respective payees in due time, because of change of residence or imperfect address, or because not called for, or because alleged to have been lost in transmission by mail. One hundred and forty-five duplicates were substituted for orders which became invalid, because not presented for payment within one year after issue; 31 for orders made invalid in consequence of having, contrary to law, more than one indorsement; 87 for orders mutilated or destroyed while in possession of the remitter or the payee; and 2 for orders lost by robbery of a post-office.

The increase in the number of duplicates during last year was 801, or about 5.84 per cent., being nearly 13 per cent. less than the ratio of increase in the orders issued.

The receipts and expenditures of the domestic money-order system, as adjusted and reported by the Auditor, were as follows, viz:

Receipts:		
Fees received for money-orders issued		$354,602 25
Amount received for premium on drafts		214 41
Total		354,816 66
Expenditures:		
Commissions to postmasters and allowances for clerk-hire	$257,928 58	
Allowances for postmasters' remittances lost in transmission by mail	4,345 56	
Incidental expenses for stationery and fixtures	23,001 32	
Bad debts	957 20	
Total		286,232 66
Excess of receipts over expenditures		68,584 00

In compliance with the act of June 8, 1872, this sum has been placed to the credit of the Treasurer of the United States for the service of the Post-Office Department.

During the fiscal year 1872, the revenue amounted to $105,977.77, being larger by $37,393.77 than that of the last year. This decrease is due to the unusually small receipts from fees, as compared with the large increase of orders issued, resulting from the reduction above mentioned of the fee for orders of $10 and under from 10 to 5 cents. In 1872 the amount of orders issued increased 15 per cent., and the fees 18⅔ per cent.; but during the last year the increase of the fees was only 1.23 per cent., while the issues were augmented 18.55 per cent. The great increase of issues and payments during the last year involved additional expenditure for clerk-hire, stationery, and other incidental items, but produced no proportionate augmentation of receipts. The public, however, has derived substantial advantage from the additional facilities afforded by greatly reduced rates for the transmission of small sums by postal orders.

During the past year the aggregate amount of surplus funds accruing at the smaller post-offices from the sale of money-orders, and remitted

by them to the larger offices designated as their depositories, was $43,885,826.68. Twenty-three of these remittances, amounting in the aggregate to $5,557.31, were reported as lost in transmission by mail, a sum larger by $1,509.31 than the reported losses of the previous year. Of this amount, the sum of $2,543.04 was allowed before the close of the year to the credit of the several postmasters who had remitted the same; credit claimed for a remittance of $200 was disallowed; the sum of $2,034.27 was recovered by special agents of the Department; and claims amounting to $780 are yet pending. The total amount allowed to postmasters during the last year for remittances lost in the mails was $4,345.56, of which the sum of $1,802.52 was on account of losses during the two preceding years. Of these former losses, the sum of $250 was charged to postmasters' accounts; the sum of $99 was recovered by special agents; and there remain unsettled cases to the amount of $560.

The drafts drawn by postmasters whose payments exceed their issues of money-orders against credits given them, from time to time, with the postmaster at New York, amounted to $5,004,800. Certain postmasters in the Pacific States and Territories, who required occasional assistance to meet their money-order payments, were furnished with funds to the amount of $52,034 by the postmaster at San Francisco, and to the amount of $23,587 by the postmaster at Portland, Oregon.

Out of the whole number of orders paid, viz: 3,314,818, it was claimed that payment of 22, amounting to $613.80, was fraudulently procured through forgery of the payee's signature, or by other unlawful or improper means, being at the rate of one fraudulent payment in every 150,673 payments.

Forty-nine cases of improperly-paid orders were investigated or undergoing examination during the year. Twenty-seven of them occurred during the previous year; and of these 12 were not brought to the knowledge of the Department until after the completion of the last annual report. In twenty-one instances the amount of the orders, the total value of which was $742.19, was recovered by special agents, and paid to the rightful owners. In six cases, amounting to $178.71, the paying postmasters were, after due investigation, held responsible for the erroneous payments. The amount of six improperly-paid orders, $252, was refunded by the Department, the paying postmasters not having been found at fault; and sixteen cases, of the aggregate value of $472.55, are still pending.

The rapid increase in the amount of the money-order business which closely followed the recent monetary disturbance and the general suspension of currency payments by the national banks is a circumstance not unworthy of notice. During the last week of September and the first three weeks of October, 1872, the number of orders issued at the fifty-six largest money-order offices was 36,744, amounting to $817,344.99 and the number of orders paid was 119,107, amounting to $1,981,724.47. During the same period of the present year, these offices issued 53,071

orders, of the aggregate amount of $1,211,297.41, and paid 163,577 orders of the total value of $3,055,696.02, showing the unprecedented increase of 48.19 per cent. in the amount of issues, and of 54.19 per cent. in the amount of payments. This statement clearly indicates the utility of the system to the public as a safe, convenient, and expeditious mode of making small remittances.

The number of international postal orders issued in this country on Switzerland was 2,801, amounting to $78,313.93, and the number from that country paid here was 600, amounting to $16,809.58; showing, in comparison with last year's business, a decrease of $7,265.99, or 8.49 per cent. in the issues, and an increase of $2,708.23, or 19.20 per cent. in the payments. The fees received amounted to $2,164, and the expenses to $24.86. It appears from the accompanying report of the Auditor, that, after the payment of all balances due Switzerland on the exchange of money-orders during the year, a net revenue of $5,152.76 accrued to the United States, of which the sum of $3,013.62 represents profits derived from the purchase, at advantageous rates, of bills of exchange in payment of gold balances.

The number of money-orders issued in this country for payment in the United Kingdom was 69,592, amounting to $1,364,476.32, and the number of British orders paid here was 10,486, of the aggregate value of $215,087.61. The fees received amounted to $40,504, and the cost of commissions to postmasters, clerk-hire, and incidental items was $15,487.18. An exact statement of the revenue of last year cannot, at present, be furnished by the Auditor, as a final settlement of the accounts of the last quarter of the fiscal year has not yet been made by the accounting officers of both countries. The revenue for the year 1872 is reported by the Auditor at $23,321.92.

From the establishment of the exchange of postal money-orders between the United States and the German Empire, on the 1st of October, 1872, to the close of the fiscal year, June 30, 1873, 19,454 orders, amounting to $420,722.12, were issued in this country in favor of payees in Germany, and 11,613 orders from that country were paid in the United States. The fees received amounted to $11,662.80, and the sum paid for commissions, clerk hire, and incidental expenses, to $1,693.65.

MISCELLANEOUS.

An appropriation for the manufacture and delivery of postal cards having been secured by the act of January 8, 1873, immediate steps were taken to meet the public demand therefor. Much delay was encountered in the preparation of the plates and in procuring suitable stock, but at length all obstacles were so far overcome that their delivery on requisitions was commenced on the 1st of May last. As predicted, they have been favorably received. They have supplied a public want, and have made a new and remunerative business for the Department. The issues foot up:

From May 1 to June 30	31,094,000
From July 1 to September 30	33,208,300
Total in five months	64,302,300

These figures indicate that the estimate of 100,000,000 for the consumption of the first year will be more than realized.

The several acts for the repeal of the franking privilege became operative on the 1st of July last. The results of the first quarter of the current year are highly satisfactory, and have fully verified the predictions of the friends of the repeal. The confusion and delay in the distribution and transmission of the mails, caused by suddenly throwing, without notice or system, immense masses of free matter upon important postal routes, have been remedied, thus making it possible to effect a decided improvement in the organization and practical working of the service.

Section 4 of the act of March 3, 1873, making it the duty of the Postmaster-General to provide official stamps and stamped envelopes for the several Executive Departments, has been strictly complied with. The stamps and envelopes furnished have been executed in the highest style of art, and will compare favorably with those of any other country. From July 1 to September 30, of the current year, the following varieties, numbers, and values were issued :

POSTAGE-STAMPS.

To whom issued.	No. of denominations.	Number of stamps.	Value.
The Executive	5	5,150	$200 00
The State Department	14	60,495	20,749 70
The Treasury Department	11	7,842,500	407,000 00
The War Department	11	446,500	17,689 00
The Navy Department	11	247,230	12,239 00
The Post-Office Department	10	10,054,660	354,535 00
The Interior Department	10	1,058,475	59,171 00
The Department of Justice	10	65,400	3,900 00
The Department of Agriculture	9	275,000	20,730 00
Making a total of	91	20,055,410	896,213 70

STAMPED ENVELOPES, ETC.

To the War Department	9	587,100	10,315 56
To the Post-Office Department	3	4,836,300	147,007 00
Making a total of	12	5,423,400	157,322 56

The stamps for the Departments other than the Post-Office do not differ materially from those for sale to the public, except that each Department has its own distinctive color and legend. The colors are: For the Executive, carmine; State Department, green; Treasury, velvet-brown; War, cochineal-red; Navy, blue; Post-Office, black;

Interior, vermilion; Department of Justice, purple; and Department of Agriculture, straw-color.

In the stamps for the Post-Office Department the medallion head gives place to a numeral representing the value, with the words "Post-Office Department" above and the denomination expressed in words below. All the official stamps correspond in denominations with those issued for the public, except in the case of the State Department, for which four of higher value were made for dispatch-bags. These four are of the denominations of $2, $5, $10, and $20, respectively, are of larger size and printed in two colors, and bear a profile bust of the late Secretary Seward.

In presenting the financial results of the abolition of franking, I am for the present confined to the operations of the stamp division for the first quarter only of the current year. To make those operations more intelligible, the following comparative statement is submitted:

Comparative statement of the value of postage-stamps, envelopes, and newspaper-wrappers, (exclusive of postal-cards and official stamps,) issued during the quarter ended September 30, in each of the years 1868, 1869, 1870, 1871, 1872, *and* 1873.

Quarter ending—	Value of issues.	Increase.	
		Amount.	Percentage.
September 30, 1868	$3,411,421 50	.....	.....
September 30, 1869	3,963,907 00	$552,485 50	16.2
September 30, 1870	3,797,513 25	*166,393 75	*4.2
September 30, 1871	4,420,135 50	622,622 25	16.4
September 30, 1872	4,659,987 50	239,852 00	5.4
September 30, 1873	4,911,102 50	251,115 00	5.4
Average percentage of increase from 1869 to 1873	.....	.....	7.8

*Decrease.

The aggregate of sales for the quarter may be arrived at thus:

Value of ordinary stamps, stamped envelopes, and newspaper-wrappers, issued during the quarter ended September 30, 1873, as above	$4,911,102 50
Add value of postal-cards issued during same quarter	332,083 00
Making a total of	5,243,185 50

An increase over the value of issues for same quarter of 1872 of $583,198, or a percentage of 12.5.

Add the value of official stamps and stamped envelopes issued to the close of quarter ended September 30, 1873, (less $1,159.56, cost of manufacturing envelopes)	1,052,356 70
Making a total for the quarter of all issues of	6,295,542 20

An increase over the total value of issues for the same quarter of 1872 of $1,635,554.70, or a percentage of 35.1.

It cannot be expected that the sales of postal-cards or official stamps will average throughout the year the extraordinary sums above given for the first quarter. A general supply having been obtained, subsequent orders will be made only for the actual consumption. Hence in the estimates for 1875 the net sales of postal-cards have been placed for the entire year at $1,034,732, and of official stamps at $2,250,000.

The large increase of receipts above stated is derived altogether from general and departmental matter and from postal-cards. Publications of the class heretofore printed and sent out by order of Congress have been almost entirely cut off since the 1st of July. Of the relief thus afforded some idea may be formed from the fact that during the three months next preceding that day there were forwarded from this city over a single route, the Baltimore and Ohio Railroad, in box-cars, independently of the amount conveyed in the regular mail-cars, 665,504 pounds of such publications, as appears from returns of the actual weight thereof taken by the company with the permission of the Department.

These facts, it is respectfully submitted, are ample to sustain the opinion, given in a special report to Congress under date of January 12, 1871, that the cost of free matter if charged with the regular rates of postage would amount to $2,543,327.72 annually; and it is hoped that they will be deemed sufficient to prevent any attempt to revive an abuse which would impose the most grievous burdens upon the postal service at a time when that service is struggling to meet the growing wants of the country in its course of unparalleled development.

In my report for 1869 I had the honor to suggest a plan for the prepayment of postage on newspapers and other matter of the second class by weight of packages, rather than by the present system, which requires the manipulation of each particular paper and allows the payment of postage at either the mailing office or the office of delivery. A careful revision of the subject confirms me in the opinion that the postage on all such matter should be collected in advance at the mailing office. Collections are now made with great difficulty, and there is no provision whatever by which dishonesty or negligence can be detected. No stamps are used for the payment of such postage, and the Department is compelled to accept in full satisfaction whatever sums of money postmasters choose to charge against themselves. So execrably bad is this system that postal officers of high standing have estimated that not more than one-third of the postage properly chargeable on newspapers is accounted for and paid over. Furthermore, disputes are continually arising between postmasters and publishers as to whether the sheets they transmit come within the meaning of the term *newspaper*, and as to the number of their *bona fide* subscribers. In the hope of contributing to a more faithful collection of postages, the more prompt and efficient transmission of newspapers, the saving of labor in post-offices, and the general advantage, as well of the Department as of publishers and their patrons, I respectfully submit the following plan for prepayment of newspapers of the second class, and urge its adoption. Let all publishers, or their business managers or agents, be required at the beginning of every quarter to state under oath that, after diligent inquiry, they are satisfied that they will send in the mails to regular subscribers during the coming quarter not more than —— copies of the newspaper known as —— ———, [giving the number of copies and name

of newspaper,] and let them be further required to pay in advance the postage prescribed by law, taking therefor duplicate receipts, one of which shall be transmitted to the Post-Office Department; and, to afford reasonable opportunity for an increase of circulation during the quarter, let the oath taken at the beginning of the next quarter embrace all additional copies for the last quarter, as well as the number to be sent during the then commencing quarter. On the other hand, let postmasters be required to return, within two weeks after the beginning of every quarter, correct lists of all the newspapers addressed to regular subscribers and dispatched in the mails from their respective offices, stating the number of copies of each newspaper, the average weight per paper, the number of issues per week, and the amount of money paid as postage therefor. Payment having been made in advance for the quarter no stamp or manipulation would be needed, but, when received into the office, every paper answering to the description given in the receipt would be treated as paid. The papers of persons subscribing after quarter-day would be forwarded immediately and paid for at the beginning of the next quarter. So marked would be the improvement in the collections under this plan, that I believe the Department could safely consent, in case of its adoption, to a reduction in newspaper rates of 40 per cent. on present prices. At the reduced rate, I am satisfied the Department would realize more revenue than now. I also believe that so great would be the saving of labor to newspaper proprietors in the preparation of their papers for the mail, and so decided their gain from the greater dispatch and freedom from mistakes in transmission and delivery, that they would find the new plan more advantageous to them than the present one. A similar plan could be adopted for magazines and periodicals of the second class.

I further recommend that on all matter of the third class the postage be made uniform at 1 cent for each two ounces or fraction thereof, and the maximum weight of packages increased to four pounds. If this recommendation be adopted, the postage on flexible patterns, samples of ores, metals, minerals, and merchandise, sample-cards, photographic paper, letter-envelopes, postal-envelopes, and wrappers, unprinted cards, plain and ornamental paper, card-board, or other flexible material, and on all other mailable matter not included in the first class, will be reduced from 2 cents to 1 cent for each two ounces or fraction thereof, and the weight of packages increased from twelve ounces to four pounds. On books the postage will be reduced from 2 cents to 1 cent for each two ounces or fraction thereof; and the weight of packages of woolen, cotton, or linen clothing addressed to any non-commissioned officer or private in the Army of the United States will be increased from two pounds to four pounds.

I also recommend that any person be permitted, without additional charge, to write a form of presentation in any book, pamphlet, magazine, periodical, or on any other matter of the third class, and also that the sender of any package be permitted, without additional charge, to

write his or her name and address on the outside thereof, with the word "from" above or preceding the same, so as to inform the person addressed of the name of the sender, and to write briefly on any package the number and name of the articles inclosed.

The present mode of determining the salaries of postmasters, so far as it affects those not appointed by the President, is very defective. Formerly the salary of every postmaster was computed by commissions on the actual receipts of the office as returned to the Sixth Auditor. In 1864 the law was changed, and it was provided that salaries should be adjusted for two years in advance upon special returns for a stated time to be made by postmasters to the First Assistant Postmaster-General, it being urged in favor of the new method that it would save a large amount of clerical labor in post-offices, as well as in the Department. The change has worked well in presidential offices, and many of the elaborate and expensive accounts of former days have been discontinued; but in the smaller offices the effect has been far from beneficial. Unfortunately there are no criteria whereby the accuracy of salary returns may be tested, except the quarterly returns made to the Sixth Auditor, and upon these the Department is obliged to rely in every case of doubt or suspicion. It has been found, however, in practice, that while a comparison can readily be made of the accounts of presidential offices, which number only 1,363, great difficulties and delays attend a like scrutiny into the affairs of the 33,244 offices filled by appointment of the Postmaster-General; and yet there is more need of the utmost care in dealing with the latter class of offices, because of their large and rapidly-increasing number, and the better opportunity they present to those in charge of them for increasing their compensation by fraudulent or excessive returns. Moreover, it has been observed, as a general result of making each man his own accountant, that, while all are eager to supply data upon which they can claim an increase of salary, very few are willing to furnish information that will lead to a reduction.

I therefore recommend that the salaries of all offices of less importance than presidential offices; that is to say, all with a salary of less than $1,000, be henceforth adjusted by a resort in the first instance to the quarterly returns in the office of the Sixth Auditor. This action will dispense with much useless labor, prevent complaint, remove a temptation to fraud, and secure an adjustment of salaries upon the basis of actual receipts, whether more or less.

The events of the past few weeks have awakened a lively interest in a plan heretofore submitted, for securing the savings of the great body of the people by a pledge of the credit and faith of the United States. In my reports for 1871 and 1872 I urged the organization of institutions for that purpose, under the title of "Post-Office Savings Banks." The name was not well chosen. The institutions I have in view and recommend are not designed, and should not be permitted, to encroach upon the legitimate powers and duties of the national banks. They are totally distinct from the banks in their scope and character, in the machinery

they employ, and in the ends they are intended to accomplish, and may be more accurately designated as Postal Savings Depositories of the United States.

The financial difficulties in which the country has been unexpectedly involved, and which still continue to oppress it, have demonstrated the necessity for some means of maintaining confidence in times of threatened disaster, and of gathering and wisely employing the immense wealth scattered among the people, to prevent panic and escape the ruin which inevitably follows in its track. That the people of the United States hold the reins of financial as well as political power clearly appears from the following tables, taken from the public debt statements, reports of the national banks, and from official accounts:

Treasury notes of all kinds, including fractional currency, in the Treasury, in the national banks, and in the hands of the public on June 30, 1869, 1870, 1871, 1872, *and* 1873.

Date.	Aggregate.	In the Treasury.	In national banks.	In the hands of the public.
June 30, 1869	$388,118,859 73	$37,097,818 89	$82,738,974 53	$268,282,066 31
June 30, 1870	395,984,940 48	28,945,067 19	96,758,465 39	270,281,407 90
June 30, 1871	396,679,380 06	9,533,363 15	124,298,373 22	262,847,643 69
June 30, 1872	398,444,131 52	15,321,689 87	125,063,881 12	258,058,560 53
June 30, 1873	432,609,332 94	*41,513,529 77	108,204,050 84	282,891,752 33

*Thirty-one million seven hundred and thirty thousand dollars of the currency in the Treasury June 30, 1873, represents special deposits for redemption of certificates of deposit issued under act of June 8, 1872, which certificates are held by the national banks as part of their reserve of lawful money.

National bank-notes held by the banks and the public on June 30, 1869, 1870, 1871, 1872, *and* 1873.

Date.	Aggregate.	On hand.	In the hands of the public.
June 30, 1869	$299,742,474 95	$17,915,295 95	$281,827,179 00
June 30, 1870	299,267,486 35	23,056,596 35	276,210,890 00
June 30, 1871	317,616,919 20	26,101,252 20	291,515,667 00
June 30, 1872	337,240,692 30	23,162,340 30	314,078,352 00
June 30, 1873	346,777,827 30	26,432,588 30	320,345,239 00

Recapitulation of currency in the hands of the public.

June, 1869.—Treasury issues	$268,282,066 31	
National bank notes	281,827,179 00	
		$550,109,245 31
June, 1870.—Treasury issues	270,281,407 90	
National bank notes	276,210,890 00	
		546,492,297 90
June, 1871.—Treasury issues	262,847,643 69	
National bank notes	291,515,667 00	
		554,363,310 69
June, 1872.—Treasury issues	258,058,560 53	
National bank notes	314,078,352 00	
		572,136,912 53
June, 1873.—Treasury issues	282,891,752 33	
National bank notes	320,345,239 00	
		603,236,991 33
Aggregate for 5 years		2,826,338,757 76
Average		565,267,751 55

On the 30th June last the public held, independent of the Treasury and the banks, $603,236,991.33. The amount of currency was then considered sufficient for all business purposes. In the month of August following a stringency began to be felt in the money market, and we have since witnessed the extraordinary spectacle of the banks suspending and declaring their inability to pay United States notes or bank-notes, or even fractional currency, to their depositors. Of course, under such circumstances, they could not continue to make their usual discounts for the accommodation of their customers. This can only be accounted for upon the theory of a general lack of confidence on the part of the people, and a consequent refusal to deposit, or invest, or even pay out in discharge of obligations the currency held by them. To meet this strange state of affairs, and to prevent a recurrence of the like in the future, many plans have been suggested—one involving an expansion of the currency, another compelling a return to specie payment, and still another providing for the issue by the Government of a convertible bond at a low rate of interest—but all open to objections more or less serious. The opinion is universal that if there could be a general restoration of confidence there would immediately be let loose an ample circulation for the entire country. If, therefore, a plan can be devised that will afford to depositors equal security to that afforded to note-holders, but little doubt can be entertained that a general amelioration of the present condition will be effected. The immense sum of $600,000,000 held by the people in June last, with the large accessions since made thereto by heavy drafts upon the Treasury and the banks, will be brought out from its places of concealment and applied to its legitimate work of aiding in forwarding our crops and products to market and in sustaining our vast manufacturing and other business interests. In my judgment, a system of postal savings-depositories would powerfully contribute to this most desirable consummation. Throughout the plan for their organization and work two ideas predominate: first, the United States is to insure the safe return of principal and interest whenever demanded; and, secondly, the extensive machinery of the Post-Office is to be used to bring its advantages home to the great mass of the people. The details would be simple, safe, and efficient. Money-order offices, as agents of the Government, would receive deposits in small sums, ranging from one dollar upward to the limit fixed by law, which sums the postmaster would forward at short intervals to the nearest depository of the United States Treasury. A certificate, fixing the responsibility of the Government, would be issued immediately to the depositor by the postmaster, and notice thereof would be sent either to the Department or some established branch office, to the end that due entry thereof might be made and a more formal acknowledgment forwarded to the depositor for the amount. No depositor should be allowed in any one year to deposit exceeding $300; no greater accumulation of deposits should be permitted for any one depositor

than $1,000; and no greater accumulation of deposits and interest should be allowed than $1,500. Meantime, however, the United States should contract to pay interest not exceeding 4 per cent., to be computed from the first day of the month following the deposit, and to stop upon the first day of the month in which any withdrawal might be made. Interest should be computed to the end of the fiscal year, and then, if not drawn, should be added to the principal. It would of course be necessary to keep an exact account of all such deposits, and of the expenses incident to the management thereof, in the Treasury Department; also to make provision for the payment of the amounts due depositors whenever and wherever they might desire to withdraw them; and to allow and credit to such accumulations a somewhat greater rate of interest than that paid depositors, so that all expenses might be paid out of the fund and the institution made self-sustaining. I am confident that the plan of operations thus generally sketched may be so amplified and guarded that the people could be efficiently served, and the Government saved from all loss or expense. The great ends to be attained are, first, absolute security; secondly, the utmost facilities for deposits, withdrawals, and transfers; and thirdly, perfect secrecy. A system thus organized and conducted would not only encourage economy and habits of saving on the part of all who might be in the way of earning small sums of money, but would tend largely to utilize and keep in circulation the immense amounts which are paid out for wages and in business, and give every depositor a direct interest in the stability of the Government. It would strengthen our national finances by pouring these accumulations into the Treasury, which, in turn, by judicious investments, could afford to monetary and banking institutions the very relief they now so eagerly seek. Thousands who doubt the security of the banks and savings institutions, whether private or organized under State laws, would cheerfully place their surplus money upon such terms in the keeping of the Government.

The extent of the benefits which will inure to the people and the Government from the establishment of this system will be best indicated by a statement of the amounts deposited in existing savings-banks in some of the States of the Union. With the means of information at my command, I am able to make only a partial statement under this head. Congress wisely provided, by the act of February 19, 1873, for an annual report to be made by the Comptroller of the Currency of the condition of all banks, banking companies, and savings-banks organized under the laws of the several States and Territories; but, on application to that officer, I have been informed that he has not yet succeeded in collecting the information necessary for such a report, and that in many of the States and Territories no returns are made by the savings-banks, either to the legislature or any State officer, and that thus they are left without any supervision whatever. I regret that I

shall be deprived for the present of the experience and industry which will doubtless be applied to the discharge of the duty imposed by the law referred to.

In the table following, the returns for Massachusetts are brought up to the 26th of October, 1862; for Rhode Island, Maine, and New Hampshire, to the year 1869–'70; for Connecticut, to January 1, 1871; for the State of New York, to January 1, 1873; and for California, to July 1, 1872:

State.	No. savings-institutions.	Number of depositors.	Amount deposited.	Average to each depositor.
Massachusetts	172	630, 246	$184, 797, 313 92	$293 21
Rhode Island	25	67, 238	27, 067, 072 00	402 55
Maine	36	39, 527	10, 490, 368 00	265 40
New Hampshire	45	71, 536	18, 759, 461 00	262 25
Connecticut	.....	178, 000	55, 000, 000 00	310 00
New York	150	822, 642	285, 286, 621 00	346 79
California	.....	58, 713	47, 784, 372 00	.....
		1, 867, 802	629, 185, 207 92	

Thus seven States had, many months ago, 1,867,802 depositors, and $629,185,207.92 on deposit, an amount greater by $3,476,930 than all the deposits, including those of individuals, the United States, and United States disbursing officers, held by all the national banks of the United States, numbering 1,919, on the 3d day of October, 1872.

Objection has been made to the establishment of postal savings depositories upon the ground that they would interfere with and overthrow the present savings banks. I respectfully submit that this objection is without foundation. Savings banks were originally established by the benevolent and philanthropic to provide safe places of deposit for the small savings of laboring people, and in the beginning they were conducted without hope of either profit or reward other than that which comes from the consciousness of doing good. In so far as they have since been used for purposes of speculation, their managers have diverted them from their original design, and to that extent have abused the confidence reposed in them. Security is to be sought above all other considerations, and hence the spirit of speculation should be thoroughly eradicated from their administration. If savings banks are subjected to risks, and prostituted for purposes of gain for their managers, they should be overthrown. If, on the contrary, they continue to be well and profitably managed, and pay a greater rate of interest than that paid by the Government, they will in no wise be put to disadvantage, because every depositor will be left free to select his place of deposit.

Nor can the national banks raise a valid objection. They are organized to afford facilities to the community by lending money on personal se-

curity, dealing in exchange, issuing notes, and receiving deposits, not for permanent investment, but as temporary custodians. Bankers should own the capital they employ. When they attempt to do business on borrowed capital they are operating on a fictitious credit and become mere speculators. If they succeed in realizing more interest than they pay they make a profit by raising the price of money above its value. If they do not succeed in so doing, then, like other unfortunate speculators they fail, and their creditors become their dupes. Hence a law prohibiting the payment of interest by the banks would simply confine them to their legitimate business, and prevent them from assuming improper risks. With the Government it is totally different. Its obligations must be met by resorting either to loans or taxation, and in determining its choice of alternatives, the paramount consideration should be the best interests of the people, whose agent it is. Sound policy dictates that the Government should lose no opportunity of borrowing from its own people, at a low rate of interest, for the purpose of discharging an indebtedness abroad, or relieving industry and enterprise at home from the trammels of taxation. But when the Government can arrest panic, restore confidence, call forth the hoarded treasure of the country, and revive the pursuits of industry, by a simple pledge of the people's credit for the people's security, who will say that that pledge should not be given?

Another objection is the tendency to centralization. To this I answer, that, if to establish postal savings depositories would be in violation of the Constitution, there is an end of the matter at once. If, on the contrary, such action would not be unconstitutional, then the only question is whether their establishment would on the whole be advantageous for the people and the Government. Since the National Government has assumed to organize and control the banking of the country, and has found warrant of law for undertaking the transmission of the people's money through the mails, it would appear that it is only discharging its whole duty and completing its financial work by providing for the safety of the small savings of the industrious and frugal poor. If, in addition, it can be shown that postal savings depositories will serve to fortify the national credit, make more equable the financial operations of the country, cultivate habits of thrift among the industrial classes, and illustrate the excellence of our institutions by protecting and augmenting the accumulations of self-denying toil, and thus in time merging the workman into the capitalist, the cry of centralization cannot be made to drown the voice of the people in their demand that the Government of the United States shall execute for their benefit the high offices enjoined upon it by the Constitution.

Another objection, more practical, if not more tenable, is based on an alleged increase of expenses and public officers. So far as the establishment of savings depositories would have any effect upon appointments its tendency would be to secure a better class of officers in

all respects. None but competent persons could discharge the duties of such institutions, and no man or party, having a reputation to sustain, would be willing to commit interests so important to unworthy hands. The Government would seek its principal agents and employés among experienced men, wherever they could be found. A numerous force of additional officers would not be required. Many persons already employed in the postal-service could be made to discharge a portion of the required duties. A force far less than that now needed in savings-banks would be sufficient, with the assistance of the machinery of the post-office, to accomplish the same amount of work, and this, together with a supervising bureau in the Post-Office Department, and the necessary accounting officers in the Treasury, is all that would be needed. The fact that the money-order office, during the past year, received, transmitted, and paid out nearly $60,000,000, shows how well that branch of the Post-Office discharges its duties. I am entirely satisfied that the character of the service would be elevated, and the work more cheaply and better done by Government officers, controlled at every step by law, and punishable by severe penalties in case of default or embezzlement, than is possible under the present irresponsible and inefficient mode in which savings-banks are conducted in many of the States.

But the argument by example is, perhaps, the most powerful. Let us, then, invoke the experience of other nations. The savings-bank, like many other products of Christian civilization, was perfected piecemeal. An institution of a kindred character was founded at Hamburgh as early as 1778, and first gave a demonstration of the power of small sums contributed by many, when aggregated, though, it is stated, its operations were confined to the granting of deferred annuities. An institution approaching nearer to the savings-bank, it is generally believed, was formed at Berne, Switzerland, in 1787. The idea, however, was fully developed in England, and the honor of its first practical application is divided among several persons, all of whom may claim to be benefactors of their race. In the year 1798 a friendly society for the benefit of women and children was established under the superintendence of Mrs. Priscilla Wakefield, and, before the year 1801, there had been combined with its main design a two-fold improvement, namely, a fund for loans and a bank for savings. In 1804 the savings-bank was more regularly organized, and Mr. Eardley Wilmot, M. P., and Mr. Spurling were appointed trustees. A prior claim, however, is raised on behalf of Rev. Joseph Smith, of Wendover, who, in 1799, circulated in his parish proposals to receive deposits during the summer and return the amount at Christmas with an addition of one-third as a bounty. The first publication in England of the idea of savings-banks, under the name of frugality banks, is also attributed to the celebrated Jeremy Bentham as early as 1797. The society next formed was opened, in 1808, at Bath, chiefly through the instrumentality of certain ladies, who received deposits rom female servants. In 1810 the first savings-bank in Scotland was

formed by Rev. Henry Duncan, minister of Ruthwell, Dumfriesshire; and, in November, 1815, the providence institution of Southampton was established, under the patronage of the Right Honorable George Rose. The seeds thus sown rapidly germinated, took root, and soon exhibited a vigorous growth. By the year 1817 there had been formed no less than seventy banks in England, four in Wales, and four in Ireland, by the voluntary association of benevolent persons. Parliament then took up the question, and, by two separate acts, recognized and organized banks for savings in England and Ireland, and, two years later, in Scotland. Thenceforth such institutions were under the protection and guidance of the law, and much labor was expended in the effort to protect them from peculation and fraud; notwithstanding all which, it has been stated by competent authority that between the years 1844 and 1857 frauds were perpetrated to the amount of £228,800. The effect was disastrous in the extreme. Confidence was destroyed, and the disposition to economize became a subject of ridicule. Attention is called to the following:

Table showing the amount of deposits and withdrawals, and the capital of savings-banks, in the United Kingdom at the end of each year, from 1841 *to* 1861, *inclusive.*

Year ending November 20—	Deposits.	Withdrawals.	Capital of savings-banks in the United Kingdom.
1841	£5, 694, 908	£5, 487, 723	£24, 536, 971
1842	5, 789, 203	5, 656, 160	25, 406, 642
1843	6, 327, 125	5, 333, 015	27, 244, 266
1844	7, 166, 465	5, 716, 275	29, 653, 180
1845	7, 153, 176	6, 697, 042	30, 950, 983
1846	7, 300, 367	7, 255, 654	31, 851, 238
1847	6, 649, 008	9, 060, 075	30, 236, 632
1848	5, 862, 742	8, 653, 108	28, 114, 136
1849	6, 196, 883	6, 522, 760	28, 537, 010
1850	6, 363, 690	6, 760, 328	28, 930, 982
1851	6, 782, 059	6, 305, 566	30, 277, 654
1852	7, 281, 177	6, 684, 906	31, 754, 261
1853	7, 653, 520	7, 116, 330	33, 362, 260
1854	7, 400, 141	7, 956, 347	33, 736, 080
1855	7, 188, 211	7, 654, 133	34, 263, 135
1856	7, 741, 453	8, 023, 583	34, 946, 012
1857	7, 581, 415	8, 375, 095	34, 145, 567
1858	7, 901, 925	7, 839, 903	36, 220, 362
1859	9, 021, 907	7, 335, 349	38, 995, 876
1860	9, 478, 585	8, 258, 421	41, 258, 368
1861	8, 764, 870	9, 621, 539	41, 546, 475
Total	151, 298, 830	152, 313, 312	.....
Excess of withdrawals	.....	1, 014, 482	.....

It is worthy of note that during the years 1847, 1848, 1849, and 1850 the withdrawals exceeded the deposits by amounts respectively of £2,411,067, £2,790,366, £328,877, and £396,638, and that in the years 1854, 1855, 1856, 1857, and 1861, also, the withdrawals largely exceeded

the deposits. The remarkable fact is also revealed that, taking the whole period between 1841 and 1861, when the increase in population in England and Wales was 4,190,496, when the exports increased from £51,545,116 to £125,102,814, and when the amount of wages paid must have been largely increased, the withdrawals actually exceeded the deposits by £1,014,482. The commercial crisis of 1847–'48, and the scarcity of money during the Crimean war, had, no doubt, a marked effect during some of the years recorded in the foregoing table; but the general result can be accounted for on no other theory than that the confidence of the masses had been weakened by the discovery of the enormous frauds above mentioned, the knowledge of the defects of the system, and the divided responsibility under which it was worked. It thus became apparent that a radical reform must be effected, otherwise the usefulness of savings-banks would be seriously impaired. After numerous failures a project for post-office savings-banks was finally brought to the attention of Sir Rowland Hill, who gave it his cordial approval. A plan having been finally matured by Mr. George Chetwynd, and approved by Mr. Frank Ives Scudamore, fixing the rate of interest at 2½ per cent., it was carried through Parliament under the powerful championship of Mr. Gladstone, and became the law of the land on the 17th day of May, 1861. The details being approved, and the necessary machinery provided, it went into effect on the 17th day of September following. The annexed table, covering its operations from that date until the 31st day of December, 1872, proves its steady and uniform growth and its triumphant success.

Operations of the British post-office savings-banks.

Period.	Number of post-office savings-banks.	Number of deposits.	Amount of deposits.	Total sum standing to credit of post-office savings-banks on books of national debt commissioners at close of the year.	Balance in hands of postmaster-general after allowing for charges of management at close of the year.	Total balance in hand applicable to payment of depositors at close of the year.
			£	£	£	£
From Sept. 16, 1861, to Dec. 31, 1862	2, 535	639, 216	2, 114, 669	1, 659, 032	35, 692	1, 694, 724
1863	2, 991	842, 848	2, 651, 209	3, 328, 182	44, 413	3, 372, 595
1864	3, 081	1, 110, 762	3, 350, 000	4, 995, 663	5, 522	5, 001, 185
1865	3, 321	1, 302, 309	3, 719, 017	6, 582, 329	4, 327	6, 586, 656
1866	3, 507	1, 525, 871	4, 400, 657	8, 231, 176	25, 791	8, 256, 967
1867	3, 629	1, 592, 344	4, 643, 906	9, 867, 703	47, 690	9, 915, 393
1868	3, 813	1, 757, 303	5, 333, 638	11, 963, 053	Nil.	11, 899, 400
1869	4, 047	1, 998, 644	5, 787, 218	13, 755, 547	19, 386	13, 774, 933
1870	4, 082	2, 135, 993	5, 995, 121	15, 305, 040	158, 888	15, 463, 928
1871	4, 335	2, 362, 621	6, 664, 629	17, 303, 815	166, 456	17, 470, 271
1872	4, 607	2, 745, 245	7, 699, 916	19, 559, 804	301, 070	19, 860, 874

Every year shows an increase in the number and amount of deposits; and on the 31st day of December, 1872, the total balances applicable to the payment of depositors amounted to the sum of £19,860,874. The postmaster-general states, in his last annual report, that the cost of each deposit and withdrawal, including postage, is now about sixpence instead of about one shilling in the old savings-banks. No greater triumph was ever achieved in post-office management, with the single exception of that of Sir Rowland Hill in effecting penny-postage.

Post-office savings-banks encountered at every step the most implacable opposition, and were established only after a prolonged struggle. The same arguments were brought to bear against them that have been used against the adoption of a like system here. It was urged that they would be destructive of the old savings-banks; that the post-office would never be able to perform the additional important duties imposed upon it; that the government was undertaking a great risk; and that the scheme was centralizing in its tendency. They were opposed by Lord Colchester, an ex-postmaster-general, and by Lord Monteagle, of Brandon, once chancellor of the exchequer. A practical trial of twelve years has conclusively established the fallacy of all the arguments adduced against this beneficent measure.

The same system, somewhat simplified, has been put into operation in the British Australian colonies, in Queensland and in Canada, with like unvarying success. Mr. J. C. Stewart, superintendent of the post-office savings banks of Canada, writes, under date of October 25, 1873:

> Post-office savings-banks work smoothly with us. We commenced five and a half years ago very much in the dark, and we have had to work out the system to a great extent unaided; but we learned to think out and reason out a system with which we are now well satisfied. There is nothing which prevents our extending it to every money-order office, save want of office accommodation at the head office.

Reason and philanthrophy being thus sustained by the prolonged experience of so many peoples speaking the English language, how can the success of similar institutions in the United States be longer doubtful? I believe that the financial perils through which we are now passing could have been mainly averted if these institutions had been open to receive deposits. The people of this country earn more and deposit more than those of any other. The State of New York alone exhibits an aggregate of savings-bank deposits equal to those of the whole United Kingdom of Great Britain and Ireland; and it is not extravagant to say that if a spirit of universal frugality could be encouraged by an assurance of good faith and absolute security, the savings of the American people would soon grow into such gigantic proportions that the voluntary loans of a single generation would exceed the whole of the national debt.

I am clear in the conviction that the establishment of postal-savings depositories will be found an eminently wise and practical measure;

and, in the hope of contributing something to that end, I will submit at an early day a form of bill embodying the necessary legislation.

A year ago I earnestly urged the assumption by Government of the control of the telegraph, and gave at some length my reasons for believing that such action would correct the defects of the present management and result in great benefit to the country. I also presented at the same time estimates of the cost of duplicating the lines and apparatus now in use. There is no need of repeating those reasons or estimates. I desire, however, to express my full confidence in the soundness of the former, and the approximate correctness of the latter, notwithstanding the efforts which have been made to invalidate them. Ample time has elapsed for a full and free discussion of the subject in all its bearings, but no points have been developed which have not already been considered. One fact is conspicuous and most significant, and that is, that the opposition to the postal telegraph comes almost entirely from the telegraph companies and those directly interested with them in sustaining their monopoly. Every intelligent disinterested observer who has seen the working of the Government systems abroad gives them the decided preference.

The necessity for an efficient and cheap mode of telegraphic communication, which shall be beyond the control of private monopolies, and within the means of all, is daily becoming more apparent. Under the present management the use of the telegraph by the masses of the people is almost prohibited, by reason of arbitrary rates, unnecessarily high charges, and a want of facilities. This assertion is verified by the testimony of the president of the Western Union Company, who stated before a committee of Congress that, out of forty millions of our population, only one million use the telegraph at all. This is certainly an anomalous condition of affairs among a people the first in the world for intelligence and business activity. It may, however, be regarded as settled that, while under the control of private companies, whose chief object is to make a profit for their stockholders, and whose skill and labor are expended in efforts to advance the prices of their stock, and to enforce the highest rates to which the public can be made to submit, the telegraph will never become a general medium of correspondence. A Government postal telegraph is the only means by which the full benefit of this great invention can be secured; for, wherever the telegraph is under government management, it is operated at its minimum cost, and the people receive the benefit in low rates of transmission and in greatly extended facilities.

Appended to this report are four tables, to which reference may be made for reliable information, derived from official sources, as to the condition, force, and operations of various government telegraphs in Europe. Table 1, kindly furnished by the director of the bureau of international telegraphs of Switzerland, gives condensed returns, show-

ing the receipts, expenditures, and other details of European systems. Table 2 gives the number of messages (exclusive of press and news messages) forwarded from postal-telegraph stations in the United Kingdom during each month of 1871 and 1872; and tables 3 and 4 give a like statement for each week and month of the first three quarters of 1872 and 1873, respectively.

Nature furnishes an inexhaustible storehouse of electricity. The earth and the atmosphere constitute the never wearying media of its transmission. Its application to infinite uses is limited only by human knowledge and ingenuity. A single generation has filled the earth with wonder, and we are still on the mere threshold of investigation. Successive improvements have contributed so much to the simplification of telegraphic apparatus that the work of the operator is no longer a mystery. Private lines, connecting the residences of merchants and other business men with their stores and offices, are increasing in number and popularity; and so notable has been the advance that electricity is now called into daily requisition to meet the ordinary wants of domestic life.

For years past the attention of inventors and scientists has been attracted to the necessity for a more rapid and less expensive mode of transmission than the Morse, which requires the message to be spelled out by a slow and tedious process, at about the speed of an ordinary writer. One of the results of their investigations is the "automatic" or fast system, now in operation between New York and Washington. This system is capable of a speed of from 500 to 800 words per minute. The average of an expert Morse operator is not over 25 words per minute. Therefore, it is evident that if the automatic method can be made to accomplish what its advocates confidently predict for it, the capacity of a single wire for business will be increased nearly or quite thirty times. This increased capacity may be again doubled, or perhaps quadrupled, if the duplex apparatus, now used every day by established companies for sending messages simultaneously in different directions on the same wire, can be successfully combined with the automatic machine. There can be no doubt of the ultimate success of the automatic principle. Its battle with an incredulous public is almost won. As soon as it shall be thoroughly developed and applied in practice, the problem of cheap telegraphy will be definitively solved.

Experiments by the French electricians and inventors, D'Arlincourt and Meyer, in the direction of rapid autographic telegraphing, have resulted in marked improvements. By the autographic system a *fac simile* of the message written by the sender for transmission is reproduced at the distant office of delivery, thus enabling the receiver to verify the signature of his correspondent. Diagrams, maps, plans, tracings, or letters written in stenographic characters or in symbols, can also be transmitted by this instrument, and as the message or drawing to be sent is itself used as a medium of transmission, and the act of sending is entirely mechanical, errors very rarely occur.

In truth, there is no limit to the possibilities of electrical and telegraphic invention. Improved processes are constantly being discovered, new instruments devised, and new adaptations made; and in the near future the entire methods and machinery of telegraphic communication will be cheapened and familiarized to such an extent that the Government will be compelled to assume their control, in order to protect the people from extortion, and to secure for them the most improved and extended facilities at the lowest possible cost. In this wide field of operation no money-making privilege should be tolerated. As well might a charter be granted for the exclusive use of air, light, or water; as well might a price be set on the winds and waves, on rivers flowing to the sea, on seed-time and harvest, and on the power which causes the seed to germinate and the fruits of the earth to grow, as to restrict for the sake of profit the use of electricity, that most subtile and universal of God's mysterious agents. The electric telegraph should be the common messenger of the human race, and no man or association of men should be permitted to burden it with excessive charges. Surely the great republic will not hesitate longer to follow kingdoms and empires in recognizing and protecting the rights of the people.

There are now but two parties in the controversy over the postal telegraph—on one side the people, on the other the Western Union Telegraph Company. At a meeting of the directors, held on the 8th of October last, the president of the company, in his report, stated its policy, with commendable candor, in the following words:

> The scale of rates fixed by competition on the most important routes, and between the principal cities, has been applied recently to the whole country east of the Rocky Mountains, so that the inducement to subscribe capital for the extension of competing lines, in order to secure the benefit of competing rates, no longer exists. At the rates now established it is impossible for any competing company to realize profits, and some of them are known to be, and all are believed to be, operating at a loss. As a result, the extension of competing lines has ceased, and it is not believed that capital can be found wherewith to inaugurate new enterprises in any quarter. The time is not distant, therefore, when the Western Union Company will be without a substantial competitor in the conduct of a business which, notwithstanding the enormous growth of the last seven years, still is in its infancy. With the increase of lines already provided and now in progress, the capacity of which the duplex apparatus hereinbefore spoken of will be able to double at small cost, it is believed that the constantly increasing volume of business, the growth of which will be stimulated by the present low and uniform rates, can be successfully handled with a less annual investment in new construction than has heretofore been necessary; so that with competition checked and in process of being extinguished, the percentage of expenses may be reduced, and the patience of the stockholders be rewarded at an early day by the resumption of regular dividends.

The Western Union Company has always contended for high rates, and enforced them with a strong hand. When new associations have been formed for the purpose of reducing rates, the Western Union has at once entered the lists to destroy its rivals, and in pursuit of victory has not scrupled to use any device which the powerful can employ against the weak. Failing to vanquish its adversary in the open field

of fair competition, it has resorted to artifice, and triumphed by making gold its weapon. Thus it has acquired, by lease or purchase, the lines of the American Telegraph Company, the Illinois and Mississippi Company, the Chicago and Mississippi Company, and the California State Company; and during the past year it has obtained control of the International Ocean and the Pacific and Atlantic Telegraph Companies by buying up a majority of their stock. Its president has attributed a loss of profits in part to "a reduction of rates rendered necessary by the action of competing companies" along their lines, and in "other sections" to a similar reduction made "in order to equalize rates and thereby remove the inducement for competing lines to extend still farther," thus evincing a settled purpose to reduce rates only that it might exterminate competing companies already organized, or which it feared would be organized.

During seven years of this enforced abstinence from high dividends, it is admitted in the above-mentioned report that the company has realized "net profits" to the immense amount of $20,312,618; and that, after paying out of such profits for dividends to stockholders $4,857,239, for interest on the company's bonds $2,216,194, for its own stock $4,054,483, for stock of Gold and Stock Company $1,173,509, for bonds of Western Union Company, redeemed and canceled, $974,075, for real estate, exclusive of Broadway and Dey street property, $318,263, for patent of Page and Duplex apparatus $73,758, for sinking-fund $249,555, and other smaller sums, it managed with the residue to effect such extensions and purchases as increased its wires from 70,000 to 160,000 miles. After this admirable exposition of what has been accomplished by "net profits," it is to be regretted that there had not been placed by the side of it, for the gratification of a curious public, an equally lucid statement of the amount of cash capital paid in by the stockholders of the Western Union Company, and of the companies out of which it has been compounded. Elated as he must have been by a contemplation of the manner in which the "net profits" had swept away all opposition, present or prospective, President Orton might well say, in the language quoted from his report, that "the time is not distant when the Western Union Company will be without a substantial competitor in the conduct of a business which, notwithstanding the enormous growth of the last seven years, still is in its infancy."

What a pleasing prospect for the people! Here it is in brief: a powerful monopoly, unchecked by opposition or the fear of it in the future, has adroitly secured possession of the whole country, and now issues its proclamation that henceforth there will be no more competition, no more reductions of rates, but always "regular dividends."

But the president of the Western Union Company did not exhaust his candor in the quotation above made. He further declared:

> The franks issued to Government officials constitute nearly a third of the total complimentary business. The wires of the Western Union Company extend into thirty-

seven States and nine Territories within the limits of the United States, and into four of the British Provinces. In all of them our property is more or less subject to the action of the national, State, and municipal authorities, and the judicious use of complimentary franks among them has been the means of saving to the company many times the money-value of the free service performed.

In another part of the same report it is stated that the total complimentary business amounted during the last year to $58,000. Then, assuming the assertion last cited to be correct, the "judicious use" of complimentary franks to the amount of $19,333 secured such action or non-action, whichever the company desired, on the part of the officials of the United States and of thirty-seven States, nine Territories, and four Provinces, as was equivalent to "many times the money-value of the free service performed." Truly a most "judicious use" of patronage! For if the subsidizing process included only the principal legislative, executive, and judicial officers of the governments, States, Territories, and Provinces above mentioned, the average value of the "complimentary frank" to each person could not have exceeded $5, or $10 at the utmost. It is presumed that hereafter very few "officials" will be willing to accept any courtesy, great or small, from the Western Union Company, now that they have been informed that the company will place the recipients of its favors upon its roll of retainers and advertise them as such.

The telegraph should be made a part of the postal system without further delay. As Congress does not seem inclined to exercise the discretion given in the third section of the act of July 24, 1866, to appoint appraisers to value the "lines, property, and effects" of the companies now in operation, and as the Western Union Company appears to be unwilling to make a voluntary sale at a fair price, I recommend that provision be made by law for the immediate establishment of the postal telegraph, and for the construction of all such lines as may be needed, under the direction of competent officers of the Engineer Corps of the Army. The experience they acquired during the war of the rebellion would enable them to do the work in the most economical and satisfactory manner.

Very respectfully, your obedient servant,

JNO. A. J. CRESWELL,
Postmaster-General.

The PRESIDENT.

APPENDIX.

No. 1.—*Estimates for expenditures for the fiscal year ending June* 30, 1875.

FIRST ASSISTANT POSTMASTER-GENERAL:			
For compensation to postmasters		$6,500,000	
For clerks in post-offices		3,250,000	
For payments to letter-carriers		2,000,000	
For wrapping-paper		27,000	
For wrapping-twine		48,000	
For marking-stamps		9,000	
For letter-balances		3,000	
For rent of post-offices	$350,000		
For fuel	150,000		
For light	160,000		
For stationery and other miscellaneous items	60,000		
		720,000	
Total for First Assistant's Bureau			$12,557,000
SECOND ASSISTANT POSTMASTER-GENERAL:			
For inland transportation	$15,582,021		
For increase of compensation on railroad routes under act of March 3, 1873	525,000		
For railway post-office clerks	1,320,014		
For route-agents	929,035		
For mail-route messengers	160,000		
For local agents	110,383		
For mail-messengers	643,533		
For baggage-masters	1,000		
		$19,270,986	
For mail depredations and special agents		160,000	
For mail locks and keys		50,000	
For mail-bags and mail-bag catchers		200,000	
For preparation and publication of post-route maps		35,000	
Total for Second Assistant's Bureau			19,157,986
THIRD ASSISTANT POSTMASTER-GENERAL:			
For postage-stamps	$118,667		
For stamped envelopes and newspaper-wrappers	535,424		
For expenses of agency	10,200		
For postal-cards	168,270		
For expenses of agency	5,600		
		$838,161	
For advertising		90,000	
For registered-package envelopes and seals		42,680	
For office-envelopes		69,500	
For dead-letter envelopes		4,585	
For ship, steamboat, and way letters		7,500	
For office-furniture		6,500	
For fees to United States attorneys, marshals, clerks of courts, and counsel necessarily employed by special agents of Post-Office Department, subject to approval by the Attorney-General		7,500	
For engraving, printing, and binding drafts and warrants		3,000	
For miscellaneous items		2,500	
Total for Third Assistant's Bureau			1,071,926
SUPERINTENDENT OF FOREIGN MAILS:			
For transportation of foreign mails		$325,000	
For balances due foreign countries		260,000	
Total for office of foreign mails			585,000
Grand total estimate for expenditures			33,929,912

Estimated amount provided by the Department, being its own revenue, accruing from postage and other sources		$29,293,549
Amount to be provided from the general Treasury to make the receipts equal the expenditures, (deficiency)		4,636,363
Expenditures under special appropriations to be provided out of the general Treasury:		
For mail-steamship service between San Francisco, Japan, and China	$1,000,000	
For mail-steamship service between United States and Brazil	150,000	
For mail-steamship service between San Francisco and Sandwich Islands	75,000	
Total		1,225,000
For official postage-stamps for use during the fiscal year		950,000
Total to be provided from general Treasury		6,811,363

EDWARD W. BARBER,
Third Assistant Postmaster-General.

POST-OFFICE DEPARTMENT,
Appointment-Office, Washington, D. C., October 13, 1873.

SIR: Agreeably to your request I submit herewith estimates of the appropriations necessary for the fiscal year ending June 30, 1875, under the following heads, viz:

For compensation of postmasters	$6,500,000
For clerks in post-offices	3,400,000
For payment of letter-carriers	2,000,000
For wrapping-paper	30,000
For wrapping-twine	48,000
For marking-stamps	10,000
For letter-balances	5,000
For rent for post-offices	400,000
For fuel for post-offices	160,000
For light for post-offices	180,000
For stationery and other miscellaneous items	80,000
Total	12,813,000

Very respectfully, &c.,

J. W. MARSHALL,
First Assistant Postmaster-General.

Hon. E. W. BARBER,
Third Assistant Postmaster-General.

POST-OFFICE DEPARTMENT,
Appointment Office, Washington, D. C., October 13, 1873.

SIR: Accompanying this I have the honor to submit a statement of the estimated expenditures, for the items named, during the fiscal year ending June 30, 1875.

The estimate for compensation to postmasters is largely increased over former estimates, from the fact that the sixth biennial adjustment of postmasters' salaries, under the acts of July 1, 1864, and June 8, 1872, will take effect July 1, 1874, and consequently must be provided for in this appropriation. As postmasters' salaries are, under the law,

based on commissions on business done at the respective offices and the box-rents accruing thereat, it is apparent that the amount necessary to be appropriated for postmasters' compensation must increase *pro rata* as the business and revenues of the postal service increase. For the year ending June 30, 1871, the Auditor's books show that $5,028,381 were paid out for compensation to postmasters, and for the year ending June 30, 1873, the amount is, (as nearly as can now be ascertained,) $5,725,468, an increase for the two years of $697,087. Taking into consideration the prospective increase in the postal business during the two years from July 1, 1873, to July 1, 1875, it is evident that an increase of $774,532, making a total of $6,500,000, will be necessary for the purpose.

The increase in the item for compensation to clerks in post-offices is also made necessary by the growth of the service. The amount expended for clerks in post-offices for the year ending June 30, 1871, as shown by the Auditor's books, was $2,582,084, and, for the year ending June 30, 1873, is about $2,978,614; showing an increase of $306,530 over the year ending June 30, 1871. Hence the increase asked for the year ending June 30, 1875, $421,386, is deemed necessary for a proper working of the service.

The estimated amount required for the free-delivery service of the fiscal year ending June 30, 1875, is $2,000,000. This sum is rendered necessary by the extension of the service to cities having a population of 20,000 within the delivery of their office, under the act of March 3, 1873, and also by the re-organization and extension of the service in several of the principal cities to adjacent cities and towns.

The amount expended for the free-delivery service, including incidental expenses, for the year ending June 30, 1871, as shown by the Auditor's books, was $1,353,926, and for the year ending June 30, 1873, is about $1,419,775; showing an increase for two years of $55,849. But the extension of the service ordered by Congress at its last session will necessitate a greatly increased expenditure for the year ending June 30, 1875, over that ending June 30, 1873, and the sum of $590,225 is not considered exorbitant for that purpose, an excess of only $290,225 over the appropriation for the present fiscal year, which is $1,700,000.

The estimate for wrapping-paper for the year ending June 30, 1875, is smaller than that for the preceding fiscal year, while an increase of $10,000 for wrapping-twine over the estimate for 1874 for that item is not considered too great. There is also a decrease in the item of marking and canceling stamps, as compared with the estimate of 1874, but the wants of the service seem to render a larger estimate necessary for letter-balances for the fiscal year ending June 30, 1875.

The increase of the estimate for each of the items, rent, fuel, and light for post-offices, and for stationery and miscellaneous items, for the year ending June 30, 1875, over that for 1874, is made requisite by the necessities of the service and its rapid extension to all parts of the country, and is not regarded as excessive.

The total amount asked for is $12,813,000.

Accompanying this communication is a tabular statement giving more definite information.

Very respectfully, &c.,

J. W. MARSHALL,
First Assistant Postmaster-General.

Hon. E. W. BARBER,
Third Assistant Postmaster-General.

omparative statement showing the estimate, the appropriation, and the expenditure for the items named below for the fiscal year ended June 30, 1873, with the percentum of increase or decrease of expenditures, with estimates for the same during that period; also the amounts appropriated for the several items for the fiscal year ending June 30, 1874, with the percentum of increase or decrease of the same compared with the expenditures of the previous fiscal year, together with the estimates for the same items for the year ending June 30, 1875, with the percentum of increase or decrease for the same compared with the appropriation for the fiscal year ending June 30, 1874.

Items.	Estimate for the fiscal year ended June 30, 1873.	Appropriation for the fiscal year ended June 30, 1873.	Expended during the fiscal year ended June 30, 1873.	Percentum of increase or decrease of expenditures over estimates for 1873.		Appropriation for the fiscal year ending June 30, 1874.	Percentum of increase or decrease over expenditures for the fiscal year ended June 30, 1873.		Estimate for the fiscal year ending June 30, 1875.	Percentum of increase or decrease over appropriation for the fiscal year ending June 30, 1874.	
				Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
For compensation to postmasters	$5,525,000	$5,525,000	$5,725,468	3.62	.....	$5,725,000	.....	.0081	$6,500,000	13.53	.....
For clerks in post-offices	2,800,000	2,800,000	2,978,614	6.37	.....	2,975,000	.....	.12	3,400,000	14.28	.....
For payments to letter-carriers	1,425,000	1,425,000	1,419,775	.....	.36	1,700,000	19.73	.....	2,000,000	17.64	.....
For wrapping-paper	30,000	30,000	23,494	.....	21.68	33,000	40.46	.....	30,000	.....	9.09
For twine	38,000	38,000	39,164	3.06	.....	38,000	.....	2.97	48,000	26.31	.....
For marking and canceling stamps	12,000	12,000	7,344	.....	38.8	12,000	63.30	.....	10,000	.....	16.66
For letter-balances	3,500	3,500	2,304	.....	34.17	3,000	30.20	.....	5,000	66.66	.....
For rent for post-offices*	250,000	250,000	606,931	16.71	.....	300,000	7.09	.....	400,000	26.15	.....
For fuel for post-offices*	110,000	110,000				130,000			160,000		
For light for post-offices*	120,000	120,000				160,000			180,000		
For stationery and miscellaneous items*	40,000	40,000				60,000			80,000		
Totals	10,353,500	10,353,500	10,803,094	4.34	.....	11,136,000	3.08	.....	12,813,000	15.05	.....

* Paid as one item.

APPOINTMENT OFFICE, *Post-Office Department, October* 13, 1873.

Estimates of amounts required to be appropriated for the fiscal year ending June 30, 1875.

For inland transportation	$15,878,821
For increase of compensation on railroad routes, under act of 3d March, 1873	535,000
For railway post-office clerks	1,382,873
For route-agents	973,276
For mail-route messengers	160,000
For local agents	120,000
For mail-messengers	643,533
For baggage-masters	1,000
For mail depredations and special agents	170,000
For mail-locks and keys	50,000
For mail-bags and mail-bag catchers	200,000
For preparation and publication post-route maps	35,000
	20,149,503

JOHN L. ROUTT,
Second Assistant Postmaster-General.

OCTOBER 8, 1873.

POST-OFFICE DEPARTMENT,
OFFICE OF THE SECOND ASSISTANT POSTMASTER-GENERAL,
Washington, D. C., October 8, 1873.

DEAR SIR: Herewith please find estimates of the amounts necessary to be appropriated for inland transportation and the items incident thereto for the fiscal year ending June 30, 1875. An accompanying table shows the annual cost of the service at the end of each of the fiscal years 1871, 1872, and 1873, with the appropriation for 1874, the estimates for 1875, and the percentage of increase from year to year. By this table it appears that the increase of the cost of inland transportation for 1872 over 1871 was 9 per cent.; for 1873 over 1872, $8\frac{1}{2}$ per cent.; and of the appropriation for 1874 over the cost for 1873, $8\frac{5}{6}$ per cent. The estimate for 1875, however, is only 7 per cent. in excess of the sum appropriated for 1874; and this ratio of increase is applied both to the regular appropriation under the head of "inland transportation," and to the $500,000 provided by the act of 3d March, 1873, expressly "for increase of compensation for the transportation of mails on railroad routes," which will require, of course, to be repeated, as the increased rate of compensation will apply as well to subsequent years as to the current year. This reduced rate of increase is adopted in view of the fact that the increase of the aggregate length of railroad routes—the most prolific source of expense—has been less during the past than during the previous year, the falling off being the difference between 8,077 miles increase in 1872 and 5,546 miles increase in 1873, a difference of 2,531 miles. From this, as well as from the existing stringency in monetary affairs, it is presumed that the progress of the railroad system of the country will be so far restrained as to justify this diminished ratio of increase in the estimate for 1875.

In the item for railway post-office clerks, the rate of increase for 1874 over 1873 is $26\frac{1}{2}$ per cent. The estimate for 1875 is only 10 per cent. over 1874, the diminished rate of increase being due to the fact that the railway post-office system will have been so far perfected by the expiration of the current fiscal year as to render advisable a less rapid extension of the service in future.

On other items incidental to railroad service, viz: route-agents, mail-route messengers, local agents, mail-messengers, and baggage-masters, the average rate of increase for 1874 over 1873 is 13.97 per cent., while the estimate for 1875 is only 7.78 per cent. over the appropriation for 1874.

The estimate for mail-bags and catchers is $200,000, the same as the estimate for the current fiscal year, although Congress reduced the amount to $180,000, supposing, no doubt, that the abolition of the franking privilege would occasion a reduction of this item of expense. Experience, however, so far, is in conflict with this expectation, the quantities used since 1st July last exceeding those required for a corresponding period in any former year.

The estimate for mail locks and keys is increased $10,000, to provide for the additional expense of substituting new for old locks and keys now nearly worn out on all the street letter-boxes connected with the free-delivery system, and on account of new patterns necessary for exclusive use on registered-letter mails.

The appropriation for special agents and mail depredations for 1873 was $156,950. This amount, less $1,916.98, was expended for the salaries, per diem, and necessary traveling expenses of 47 special agents. At the beginning of the current year, the extension of the mail service into new territory, rendering imperative the necessity for extended oversight thereof, the number was increased, and 55 are now employed. No abatement of this force being practicable, the estimate for 1875 is placed at $170,000.

The estimate for 1875 for the preparation and publication of post-route maps is placed at $35,000, against $27,000 appropriated for the current year. This increase is consequent upon the growing demand by leading post-offices, special agents, members of Congress, and various public institutions, for the maps already published and others now in course of preparation, necessitating additions to the working force of the topographer's office, and also the expense necessary for the reproduction by photo-lithography of manuscript maps of the new States and Territories, the surveys of which are so incomplete and inaccurate as to forbid for the present the engraving of elaborate plates.

The aggregate amount of the estimates for all of the above-mentioned items for 1875 is $20,149,503, against $18,764,941 appropriated for 1874, an average excess of 7.38 per cent.

All of which is respectfully submitted.

Your obedient servant,

JOHN L. ROUTT,
Second Assistant Postmaster-General.

Hon. J. A. J. CRESWELL,
Postmaster-General.

POST-OFFICE DEPARTMENT,
OFFICE OF THE SECOND ASSISTANT POSTMASTER-GENERAL,
Washington, D. C., October 8, 1873.

SIR: In compliance with your request of the 9th July last, I submit herewith estimates of the amounts required to be appropriated for the fiscal year ending June 30, 1875, for inland mail transportation and items incident thereto, with a table showing the increase and decrease per

cent. between the expenditures for the years 1871, 1872, and 1873, the appropriations for 1874, and the estimates for 1875. I inclose also a copy of a letter addressed by me to the Postmaster-General, setting forth the reasons which have governed me in determining the amounts proper to be appropriated for 1875 for the several items embraced in the list.

Very respectfully,

JOHN L. ROUTT,
Second Assistant Postmaster-General.

Hon. E. W. BARBER,
Third Assistant Postmaster-General.

Cost of inland transportation, railway post-office clerks, route-agents, mail-route messengers, local agents, mail-messengers, and baggage-masters in charge of registered packages, for the years 1871, 1872, *and* 1873; *with appropriation for* 1874 *and estimate for* 1875, *including appropriation for mail depredations and special agents, mail-locks and keys, mail-bags and mail-bag catchers, and for preparation and publication of post-route maps for* 1874, *with estimate for same for* 1875; *also including appropriation for re-adjustment of pay on railroad routes under act of 3d March,* 1873.

	Cost, 1871.	Cost, 1872.	Increase, per cent.	Cost, 1873.	Increase, per cent.	Appropriation, 1874.	Increase, per cent.	Estimate, 1875.	Increase, per cent.
Inland transportation	$11,529,395	$12,566,802	9	$13,635,341	8½	$14,840,020	8 5-6	$15,878,821	7
Increase of compensation on railroad routes, under act of 3d March, 1873						500,000		535,000	7
Railway post-office clerks	649,400	821,200	26½	993,800	21	1,257,157	26½	1,382,873	10
*Route-agents	671,280	737,820	10	804,360	9	884,796	10	973,276	10
*Mail-route messengers	61,910	89,910	45¼	117,910	31	171,264	45¼	160,000	†6½
*Local agents	58,430	69,216	18½	80,302	16	95,158	18½	120,000	26
*Mail-messengers	433,393	486,922	12⅓	540,451	11	607,107	12⅓	643,533	6
*Baggage-masters	1,113	1,476	32 1-16	1,839	24 3-5	2,429	32 1-16	1,000	†58 4-5
Mail depredations and special agents						160,000		170,000	
Mail locks and keys						40,000		50,000	
Mail-bags and mail-bag catchers						180,000		200,000	
Preparation and publication of post-route maps						27,000		35,000	
						18,764,931		20,149,503	

* On the items marked with an asterisk (*) the average increase for 1874 over 1873 is 13.97 per cent., and for 1875 over 1874, 7.78 per cent. † Decrease.

JOHN L. ROUTT,
Second Assistant Postmaster-General.

OCTOBER 8, 1873.

POST-OFFICE DEPARTMENT,
OFFICE OF THIRD ASSISTANT POSTMASTER-GENERAL,
Washington, D. C., October 20, 1873.

SIR: I have the honor to submit herewith tables showing:

1. Estimate of the expenditures and revenue of the Post-Office Department for the fiscal year ending June 30, 1875.

2. Receipts and expenditures during the fiscal year ended June 30, 1873, compared with previous years.

3. Statement in detail showing payments charged to miscellaneous account.

4. Estimate of the indebtedness of the Post-Office Department June 30, 1873, not yet adjusted.

5. Receipts and disbursements at Treasury depositories on account of the Post-Office Department.

6. Receipts and disbursements at depository post-offices on account of the Post-Office Department.

7 and 8. Number and value of postage-stamps, stamped envelopes, and newspaper-wrappers issued during the fiscal year ended June 30, 1873.

9. Increase of same over preceding fiscal year.

10. Number and value (actual or nominal) of dead-letters received and disposed of during the fiscal year ended June 30, 1873.

In respect to the amount estimated as required for expenditures during the next fiscal year, your attention is invited to the remarks made by the First and Second Assistant Postmasters-General in their reports, which show the necessity for the sums required by their bureaus, and to the following detailed statement concerning the various appropriations asked for by this Office.

ADHESIVE POSTAGE-STAMPS.

The number of postage-stamps issued during the fiscal year ended June 30, 1873, was	601,931,520
Add 11 per cent., rate of increase over preceding year	66,212,467
Gives estimated issue of ordinary stamps for fiscal year ending June 30, 1874, as	668,143,987
Add 11 per cent. for increase as before	73,495,838
Gives estimated issue of ordinary stamps for fiscal year ending June 30, 1875, as	741,639,825
Add for official stamps for Executive Departments	50,000,000
Gives estimated total issue for fiscal year ending June 30, 1875, as	791,639,825
Cost of manufacturing that number, at present contract price, 14.99 cents per thousand	$118,667 00

In the above estimate the issues of ordinary stamps for the year ended June 30, 1873, and the increase of that over the previous year, are taken as a thoroughly safe basis of calculation. For the official stamps no reliable data is obtainable, although, judging from the issues already made, the number will not vary greatly from 50,000,000.

STAMPED ENVELOPES AND NEWSPAPER-WRAPPERS.

The cost of stamped envelopes and newspaper wrappers issued during year ended June 30, 1873, was	$426,836 66
Add 12 per cent., rate of increase over preceding year	51,220 40
Gives estimated cost for year ending June 30, 1874	78,057 06
Add 12 per cent. as before	57,366 85
Gives estimated cost for year ending June 30, 1875	535,423 91

The contract under which stamped envelopes and newspaper-wrappers are being furnished is for four years, and will expire September 30, 1874. The issues for three-quarters of the next fiscal year will therefore be under a new contract; but, as the rates in the present contract are considered fair and reasonable, no allowance has been made for a change in prices.

For the aggregate, the same basis is taken as in the estimate for postage-stamps, namely, the cost for the year ended June 30, 1873, and the increase of that over the preceding year.

Considering the steady growth of the business of the country, and the advantages in the use of stamped envelopes over postage-stamps, an annual increase of 12 per cent. cannot be regarded as excessive.

POSTAGE-STAMPS AND STAMPED-ENVELOPE AGENCY.

Salaries of distributing agent and assistants	$8,700 00
Incidental expenses of agency	1,500 00
	10,200 00

The number of persons at present employed for the distribution of stamps, stamped envelopes, &c., is five, viz: an agent, whose salary is $2,500 per annum; one clerk, at $1,800; two clerks, at $1,600; and one at $1,200. This force is deemed sufficient for the probable needs of the service during 1874–'75, and no increase is estimated for.

The incidental expenses consist of the expenses of the agent when required to visit the Department, or while absent from New York in making any investigations ordered by this Office; also the expenses of agents ordered to make investigations in connection with the issue of stamps or stamped envelopes.

POSTAL CARDS.

The period since the introduction of postal cards, on the 1st of May last, has been too short, and the demand too irregular, to furnish any strictly reliable data on which to base an estimate of future needs. The total number of cards issued during the five months up to the 1st October was 64,302,300; but this number was doubtless far in excess that actually used, which is not ascertainable.

The Department completed its first supply to all the principal offices about the 1st of August, and, assuming that this left a sufficient "carrying stock" in the hands of postmasters and the public at that time, the subsequent issues may be taken as some indication of the real demand.

The following estimate is therefore made on the basis of the issues during the months of August and September:

Number issued during August and September 1873	18,227,300
Total for current fiscal year, at same rate	109,396,800
Add 10 per cent. for increase of next year	10,939,680
Gives estimated number for next fiscal year	120,300,180
Cost of that number, at $1.39⅞ per 1,000	$168,269 88

POSTAL-CARD AGENCY.

Salaries of agent and assistants	$4,600 00
Incidental expenses of agency	1,000 00
	5,600 00

At present there are employed at Springfield, Mass., in connection with the inspection and distribution of postal cards, an agent, at a salary of $2,000 per annum, and two clerks, at $1,200 each. This number is thought to be sufficient for the prospective increase in issues during the next fiscal year, but I would recommend an increase in the salary of one of the clerks, making the force stand: the agent, $2,000; one clerk, $1,400, and one clerk, $1,200.

The remarks under the heard of "postage-stamp and stamped-envelope agency" as to incidental expenses will apply also to the appropriation requested for this agency.

ADVERTISING.

This item covers advertisements for proposals for carrying the mails, for unclaimed letters at post-offices, and for proposals for supplies of all kinds.

Heretofore, contracts for supplies have been made for two years or more, but under the operation of a resolution of Congress approved January 31, 1868, the term of such contracts is limited to one year. In view of this fact a considerable increase in this item of expenditure is expected.

The payments made for this purpose were:

During the fiscal year ended June 30, 1869	$79,565 41
During the fiscal year ended June 30, 1870	66,571 80
During the fiscal year ended June 30, 1871	57,459 80
During the fiscal year ended June 30, 1872	53,112 33
During the fiseal year ended June 30, 1873	81,412 60
The amount appropriated for the year ending June 30, 1874, is	70,000 00
On account of the fact stated above, I have thought it proper to estimate the amount required for the fiscal year ending June 30, 1875, as	95,000 00

REGISTERED-PACKAGE ENVELOPES AND SEALS.

It is estimated that there will be required for use during the fiscal year ending June 30, 1875:

4,000,000 registered-package envelopes, at $9.17 per M	$36,680 00
4,000,000 registered-package seals, at $1.50 per M	6,000 00
	42,680 00

The estimate of cost is based on the prices now paid for the envelopes and seals. This is done for the reason that, although the present contract for package-envelopes will expire June 30, 1874, it is not probable there will be any material change in the price.

Although the number of registered letters increases each year, I have only asked for a number of package-envelopes and seals equal to that estimated as required for use during the current fiscal year. Improvements in the system are contemplated, whereby the necessity for a much greater number of package-envelopes and seals than the number of registered letters transmitted will be obviated. Registered pouches, with locks specially constructed for the service, are to be sent direct from one large office to another, carrying all the registered mail between those offices. It is also proposed to transmit a registered letter from the mailing office to the delivery office in the package-envelope in which it is placed at the mailing office, instead of having the package opened at each distributing office, and a new one used for further transmission, as is now the case. By these means, while the number of registered letters will, in consequence of the greater celerity and security in their transmission, probably be largely increased, the number of package-envelopes and seals now estimated for will doubtless be ample to cover the growth of the business.

POST-OFFICE ENVELOPES.

Number of official envelopes issued during the fiscal year ended June 30, 1873	14,180,590
Add 20⅝ per cent., rate of increase over preceding year	2,926,105
Gives estimated issue for year ending June 30, 1874	17,106,695
Add same rate of increase	3,542,031
Gives estimated issue for year ending June 30, 1875	20,648,726
Estimated cost of same at present contract prices	$69,500 59

The above figures explain themselves. The large increase in the number of envelopes is due mainly to the rapidly-increasing popularity of the registry and money-order systems, for the business of which these envelopes find their principal use.

The contract from which the prices are taken expires July 1, 1874, and it is not believed that envelopes of equally good quality with those now used can be obtained at much, if any, cheaper rates.

DEAD-LETTER ENVELOPES.

Number of dead letters returned to writers during fiscal year ended June 30, 1873	1,796,952
Add 17½ per cent., rate of increase over preceding year	314,467
Gives estimated number for year ending June 30, 1874	2,111,419
Add 17½ per cent. increase as before	369,498
Also add 5 per cent. for loss of envelopes by misdirection	124,046
Gives estimated number of dead-letter envelopes required for fiscal year ending June 30, 1875	2,604,963
The cost of which, at present contract prices, will be	$4,584 73

The number of dead letters to be returned to the writers thereof increases annually in about the ratio stated in the above table. A further increase of 5 per cent. is added for the next fiscal year, it being found that, owing to various causes, about that percentage of envelopes are spoiled by misdirection, &c.

The cost is calculated on present contract prices. Although this contract will expire August 10, 1874, the rate now paid ($1.76 per 1,000) is so reasonable that no material reduction therefrom is anticipated.

SHIP, STEAMBOAT, AND WAY LETTERS.

This appropriation is required to pay masters or owners of vessels not employed in carrying the United States mails, for letters brought in their vessels and delivered to post-offices at ports of arrival, and from thence transmitted in the mails. (See sections 166, 222, 223, and 224 of act approved June 8, 1872.)

There is no reliable data from which the amount required for the next fiscal year can be estimated, as the payments vary from year to year, having been—

During the fiscal year ended June 30, 1869	$8,076 35
During the fiscal year ended June 30, 1870	9,247 59
During the fiscal year ended June 30, 1871	10,716 45
During the fiscal year ended June 30, 1872	7,011 06
During the fiscal year ended June 30, 1873	4,259 96
The amount appropriated for the year ending June 30, 1874, is	10,000 00
I therefore estimate the amount required for the fiscal year ending June 30, 1875, as	7,500 00

OFFICE FURNITURE.

The appropriation asked for under this head is for the purpose of allowing postmasters at small offices to purchase desks or cases for the safe-keeping of letters. (Section 33, regulations of 1873.)

The amounts expended for this purpose were:

During the fiscal year ended June 30, 1869	$2,284 65
During the fiscal year ended June 30, 1870	2,198 37
During the fiscal year ended June 30, 1871	3,211 51
During the fiscal year ended June 30, 1872	6,535 58
During the fiscal year ended June 30, 1873	6,368 57
The amount appropriated for the year ending June 30, 1874, is	6,500 00
In consideration of the data above noted it is estimated that there will be required for the next fiscal year the sum of	$6,500 00

FEES TO UNITED STATES ATTORNEYS, MARSHALS, CLERKS OF UNITED STATES COURTS, ETC., ETC.

The payments made under this head vary from year to year according to the exigencies of the service. The following table shows that—

During the fiscal year ended June 30, 1869, there was expended	$6,758 74
During the fiscal year ended June 30, 1870, there was expended	8,965 10
During the fiscal year ended June 30, 1871, there was expended	6,431 55
During the fiscal year ended June 30, 1872, there was expended	5,141 76
During the fiscal year ended June 30, 1873, there was expended	6,480 76
The amount appropriated for the fiscal year ending June 30, 1874, was	7,500 00
Amount estimated for the next fiscal year	$7,500 00

ENGRAVING, PRINTING, AND BINDING DRAFTS AND WARRANTS.

This item covers the expense of furnishing the drafts and warrants used in collecting amounts due by postmasters, and in making payments to the creditors of the Department. Being printed from steel plates, the work is not done by the Congressional Printer.

The amount appropriated for the current year is	$3,500 00
Amount estimated as required for the fiscal year ending June 30, 1875, is	3,000 00

MISCELLANEOUS.

Under the head of this appropriation are charged the small items of necessary expense not included in any regular appropriation. The expenditures have varied, during the past four years, from $80 to $2,000. The amount appropriated for the current year is $2,500. It is estimated that not more than that sum will be needed during the next fiscal year, and I have therefore asked for a like amount, viz, $2,500.

There was appropriated for the service of this Bureau during the current fiscal year the sum of $1,046,763. The foregoing estimates show that $1,076,926 will be needed for the next fiscal year; an increase of $30,163, about 2⅞ per cent., although the increase in the demand for postage stamps, stamped envelopes, newspaper wrappers, and postal cards, for the manufacture of which the largest part of the sum asked for is required, is estimated at from 10 to 12 per cent.

The following résumé shows the operations of the different divisions of this Bureau during the past fiscal year, together with the need for a

larger clerical force in some of them, consequent on the growth of the service which entails greater labor in keeping accounts, paying creditors, furnishing stamps, &c., exercising control over the registered-letter system, and receiving and sending out dead letters.

DIVISION OF FINANCE.

During the fiscal year ended June 30, 1873, the books of this division show that 2,983 contracts, and 5,438 orders of the Postmaster-General for mail-service were entered; 26,856 reports of the Auditor for pay of mail-contractors, special, blank, stamp, postal-card, and mail-lock agents, and other creditors of the Department were examined, compared, and the calculations thereof verified; orders for recognition of mail-service were modified on discovery of errors, and the amounts of all entered on the ledgers.

Warrants to the number of 8,005, representing $9,709,737.85, and 18,898 drafts, amounting to $2,754,891.63, were issued and posted; payments on account of previous fiscal years being kept separate from those of last year.

The weekly accounts of receipts and disbursements at thirty-nine Treasury depositories were examined, verified, and entered, and the correspondence in connection therewith attended to.

The monthly and quarterly accounts of receipts and disbursements at 178 depository draft post-offices were treated in the same manner, as were also the daily, weekly, monthly, or quarterly deposit-accounts of 3,702 depositing post-offices, their certificates of deposit credited, and quarterly statement of balances forwarded to each.

In addition, the general mail for the entire Bureau was opened, the letters classified, indexed, and referred to the proper division, and when replied to filed for preservation. Letters on subjects not properly belonging to any particular division were answered by this, and all correspondence sent out from the Bureau copied and properly entered on the record ledger.

DIVISION OF POSTAGE-STAMPS AND STAMPED ENVELOPES.

The number of adhesive postage-stamps issued to postmasters for sale to the public during the year was 601,931,520, valued at $16,681,189; of stamped envelopes, plain, 65,014,600, valued at $1,722,512; of stamped envelopes bearing a "return request," 52,201,250, valued at $1,544,567.50; of newspaper-wrappers, 13,956,750, valued at $140,567.50; and of postal cards, 31,094,000, valued at $310,940; making a total number of 764,198,120, and a total value of $20,399,776. The increase in the value of issues over the preceding year was $1,329,148, or 6.97 per cent.

In addition to the foregoing there were distributed prior to the close of the year, for use after July 1, official postage-stamps and stamped envelopes as follows: to the Executive, 4,650 stamps, valued at $150; to the State Department, 60,495 stamps, valued at $20,749.70; to the Treasury, 6,317,500 stamps, valued at $200,000; to the War Department, 440,500 stamps, and 587,100 stamped envelopes and wrappers, valued at $26,585; to the Navy Department, 160,830 stamps, valued at $8,509; to the Interior Department, 970,475 stamps, valued at $50,261; to the Department of Justice, 55,400 stamps, valued at $3,750; to the Department of Agriculture, 135,000 stamps, valued at $6,530; to the Post-Office De-

partment, for use of its various bureaus, &c., 974,000 stamps, valued at $53,310, and to postmasters, 4,536,610 stamps and 4,354,750 stamped envelopes, valued at $267,103.50; making a total of 13,655,460 stamps, valued at $494,974.70, and 4,941,850 stamped envelopes and wrappers, valued at $141,973.50; or, 18,597,310 stamps, envelopes, and wrappers, valued at $636,948.20.

In calculating the value of both ordinary and official stamped envelopes and wrappers, only the postage or net value is taken into account.

There were also issued within the year 2,142,000 registered-package envelopes, 14,120,340 post-office envelopes, and 1,079,100 dead-letter envelopes; total, 17,341,400.

The total number of requisitions filled was 209,236, as follows: for ordinary postage-stamps, 78,209; for official postage-stamps, 17,168; for ordinary stamped envelopes and wrappers, plain, 40,073; for "special request" stamped envelopes, 27,964, (embracing 42,791 different "requests;") for official stamped envelopes, &c., 219; for postal cards, 1,686; for registered-package envelopes, 21,912; and for post-office envelopes, 22,105.

The number of packages of ordinary postage-stamps forwarded was 78,221; of official postage-stamps, 17,223; of ordinary stamped envelopes and wrappers, "plain," 48,593; "request," 39,816; of official stamped envelopes, &c., 29; of postal cards, 2,782; of registered-package envelopes, 23,010; and of post-office envelopes, 55,262; total, 264,936, all of which were registered.

The losses in the mails during the year amounted to only $67.45, and consisted of three packages of postage-stamps valued at $59, with one package of stamped envelopes valued at $8.45. These are by far the smallest losses of the kind ever occurring in any previous year.

In the record of work performed, as stated above, will be found the number of requisitions for postage-stamps, stamped envelopes, &c., and postal cards filled, and the number of packages used in transmitting the same. These figures apply equally well to the labors of the stamp and postal card agencies of this division, and I am glad to bear witness to the zeal and efficiency with which both agents have performed the duties devolving on them. Each has promptly filled every order and manifested the utmost care for the interests of the Department, not only in immediate attention to requisitions, but also in supervising the manufacture of stamps, stamped envelopes, newspaper-wrappers, and postal cards.

This division is among the most important under my charge. From its operations are derived almost the entire postal revenue, amounting to over twenty millions of dollars annually. Its dealings with over 33,000 postmasters, of whose accounts it furnishes the basis, call for a system that will admit of no fault in the execution of its details. Every stamp is charged as soon as the order is given at the Department for its supply, and must be closely followed until its proceeds are satisfactorily accounted for. The proper filling of a postmaster's requisition, in kind, number, and amount, is a matter requiring the exercise of great care and judgment; governed by the relative demands of the several rates of postage, the average sales of the office, the amount and character of stock on hand, the sufficiency of the postmaster's official bond, and the proper rendition of his accounts to the Auditor.

The labor of this division has been largely increased within the past few months by the introduction of postal cards and official stamps and envelopes, and the inordinate increase of the regular stamps and envelopes. The clerical force numbers 29; has not been enlarged to a degree

corresponding with the work, and the new duties imposed have been performed only by the most extraordinary effort. The necessity for additional clerks, asked for in the estimate for the next fiscal year, will be apparent on consideration of the above recited facts.

DIVISION OF REGISTERED LETTERS.

Hitherto comparatively little attention has been paid to the system of registering letters. No statistics have been collected, and, consequently, nothing is definitely known regarding its past operations, save that, judging by the number of package-envelopes and seals issued, the yearly increase in its use has been considerable.

In order to not only meet the wants of the public, but also to obtain reliable data for the information of the Department, the system has been modified, more certain and speedy transmission endeavored to be attained, reports required quarterly from postmasters, and the details of the working of the whole branch put under the immediate charge of a division created for the purpose.

The many handlings which heretofore have retarded the transmission of a registered letter will, under the operation of the revised system, be materially lessened. All such letters passing between large offices will, in a short time, be sent direct in a special pouch which can be opened by none but the mailing and receiving offices, and a further improvement, by which no registered package will be opened until it reaches the place of delivery, is contemplated. When these reforms take effect not only will the rapidity of transmission be increased, but the certainty and safety of delivery facilitated. These, of themselves, will be of benefit by increasing public confidence in the system, and will doubtless prove valuable auxiliaries in augmenting its receipts. Besides, the number of package-envelopes required will then be no greater than the number of letters registered, and the expense be made commensurate to the receipts.

To exercise the proper supervision over the system, and keep the records of the number of letters transmitted, it will be necessary to employ a larger clerical force on the work. None can be spared from other divisions of this Bureau, and I am therefore compelled to ask that at least two additional clerks be employed as soon as possible for this purpose. The preparation of the necessary books and the keeping of the records will occupy their entire time and attention, leaving the duty of replying to correspondents and instructing officials to the clerk in charge of the division, in addition to the labor performed by him under my personal directions.

Before concluding my remarks on this branch of the service and its necessities, I would call attention to the great number of post-offices which now remain unsupplied with postmarking stamps. It is believed that at least one-third of all the offices in the United States, from want of a proper stamp, now postmark all letters with a pen. As the registration regulations require the postmark to be stamped or written on the seal of the registered package-envelope, as well as on the envelope itself, it has been ascertained that the want of a stamp has materially aided in the rifling of a package by a dishonest postmaster or his clerks. Where the name of the office is *written* the seal can be removed or destroyed, the tongue of the package cut, the flap raised, the contents rifled, the envelope regummed together, a new seal put on, on which the name of the post-office is written, and then, to all appearances, the package is as perfect as when it left the mailing office. In tracing depredations on

registered letters, it has been found that the primary cause of a great number has been the ease by which the name of the sending post-office can be imitated on a new seal. Were post-marking stamps furnished all offices, the danger would be diminished in proportion to the difficulty of counterfeiting them.

Considering the fact that the Department endeavors to attain, as nearly as possible, perfect safety in the transmission of registered letters, I respectfully and urgently recommend that every office in the country be supplied with a post-marking stamp.

It may also be proper to state that beyond the transmission of letters on which a fee is paid, the system is, by law, compelled to carry, free of fee, all remittances of fractional currency sent to the Treasurer of the United States for redemption, and by regulation transports in the same manner all money-order funds for deposit, all stamps, stamped envelopes, postal cards, and official envelopes, together with all valuable matter sent from or to the Department. The number of packages of stamps, stamped envelopes, newspaper-wrappers, postal cards, and post-office envelopes transported during the last fiscal year amounted to 241,926; of which only four, possessing a value of $67.45, were lost.

DIVISION OF DEAD LETTERS.

The operations of the dead-letter office during the last fiscal year were, briefly, as follows:

Number of letters received.

Ordinary	2,951,281
Drop	657,402
Unmailable	360,626
Hotel	25,066
Fictitious	44,318
Registered	2,034
Returned from foreign countries	93,501
Total domestic letters	4,133,928
Foreign letters	268,420
Total	4,402,348

Possessing an actual or nominal value of $5,795,764 11

Of this number there were—

Delivered to owners or writers	1,557,688 valued at	$5,377,923 27
Not delivered, but returned and filed for reclamation	31,388 valued at	132,993 33
Not delivered, but either returned and destroyed, or, possessing no value (containing circulars, &c.,) were destroyed without attempt to return to writers	2,801,902 valued at	.....
Either not acted upon, or outstanding in the hands of postmasters June 30, 1873	11,370 valued at	284,847 51
	4,402,348	5,377,923 27

The amount of money deposited in the Treasury from receipts by this division was, during the year, as follows:

Unclaimed dead-letter money	.....	$6,208 00
Proceeds of sale of waste-paper	$3,401 55	
Proceeds of sale of post-route maps	502 40	
Proceeds of sale of old carpets	239 56	
		4,143 51
Total		10,351 51

GENERAL RECOMMENDATIONS.

Of the 139 clerks employed in this Bureau there are two who receive $2,500 per annum, (the chief of the division of dead letters and the stamp-agent at New York,) two who receive $2,000, (the chief clerk of the Bureau and the postal-card agent at Springfield,) and only six whose salary is $1,800 per annum, one of whom is in the stamp agency at New York. In view of the importance of the work under my charge, which fully appears from the foregoing statement, and the proper performance of which requires care, skill, and experience, I beg leave to recommend, in addition to the increased number asked for in the estimate for next year, that a greater number of clerks of the higher grades be allowed, so that those engaged upon the most important work may receive pay commensurate with the value of their services.

EDWARD W. BARBER,
Third Assistant Postmaster-General.

Hon. JOHN A. J. CRESWELL,
Postmaster-General.

No. 3.—*Statement of payments made under sundry heads charged to miscellaneous accounts for the fiscal year ended June* 30, 1873.

For regular allowances to postmasters for rent, light, fuel, stationery, and miscellaneous items during the fiscal year ended June 30, 1873	$498,791 32	
Less amounts allowed and subsequently recharged to postmasters	1,050 70	
Amount actually allowed and paid		$497,740 62
For extra allowances for same items for years 1868, 1869, 1870, 1872, and 1873		8,094 88
For preparing and publishing post-route maps		25,168 35
For registered-package envelopes		41,881 02
For envelopes for official use of postmasters		45,449 01
For envelopes for return of dead letters to writers		1,899 22
For letter-balances		2,304 24
For twine, (cotton, $30,700.42; hemp, $8,464)		39,164 42
For fees paid to United States marshals		2,014 12
For fees paid to United States attorneys		3,981 00
For fees paid to United States clerks of courts		485 64
For engraving, printing, and binding drafts and warrants		1,621 88
For miscellaneous items		86 50
Total		669,890 90

EDWARD W. BARBER,
Third Assistant Postmaster-General.

No. 4.—*Estimate of indebtedness of Post-Office Department on June* 30, 1873, *and not yet adjusted.*

Balances due foreign countries	$116,200
Mail-service under contract or recognized, but not yet reported for payment.	393,643
Mail-service unrecognized	157,000
Total	663,843

EDWARD W. BARBER,
Third Assistant Postmaster-General.

No. 2.—*Statement exhibiting receipts and expenditures, under appropriate heads, by quarters, and June*

RECEIPTS.

	Quarter ended September 30, 1872.	Quarter ended December 31, 1872.	Quarter ended March 31, 1873.	Quarter ended June 30, 1873.
Letter-postage	$81,861 94	$88,132 10	$95,658 47	$83,196 98
Newspapers and pamphlets	264,722 72	264,149 53	276,113 22	268,012 72
Emoluments	287,906 22	283,605 96	284,110 51	294,419 69
Fines	1,036 65	328 28	850 67	1,701 79
Stamps and stamped envelopes sold	4,783,224 94	5,004,483 06	5,310,054 35	5,227,055 15
Dead letters	1,960 00	2,035 00	1,096 00	1,117 00
Internal revenue from postmasters				
Miscellaneous	5,422 23	4,451 72	4,850 37	6,600 30
Revenue from money-order business				68,584 00
Total	5,426,134 70	5,647,185 65	5,972,733 59	5,950,687 63

Comparison, including revenue from money-order business:
Increase of receipts over year ended June 30, 1872, $1,081,315.20, or 4.93 per cent.
Increase of receipts over year ended June 30, 1871, $2,959,696.15, or 14.77 per cent.

EXPENDITURES.

Compensation to postmasters	$1,436,300 32	$1,425,081 66	$1,440,526 55	$1,423,559 59
Ship, steamboat, and way letters	1,309 25	1,112 62	801 31	1,034 78
Transportation of the mails	3,932,695 00	4,097,944 19	4,241,513 12	4,561,530 27
Wrapping-papers	4,600 00	5,199 00	2,150 00	11,545 49
Office-furniture	2,423 35	1,471 15	1,006 15	1,467 92
Advertising	18,462 59	50,752 17	8,114 16	4,083 68
Mail-bags and catchers	39,495 84	46,311 19	55,375 85	29,044 32
Blank agent and assistants	2,500 00	2,500 00	2,500 00	
Mail-locks, keys, and stamps	2,729 13	3,496 22	4,731 71	27,420 24
Mail depredations and special agents	41,645 01	38,721 29	38,457 16	39,139 80
Clerks for post-offices	721,095 62	735,881 46	738,782 26	782,854 90
Postage-stamps and stamped envelopes	142,227 40	176,590 56	178,660 84	156,442 96
Letter-carriers	354,872 75	360,078 61	353,563 93	354,475 40
Dead letters				
Repairs to Post-Office building	11,735 15			
Miscellaneous	139,994 51	164,867 01	162,012 61	203,016 57
Balance due Great Britain		34,518 22	10,438 96	
North German Union	107,461 22	60,876 24	31,870 67	38,661 16
France				
Belgium	4,386 95	2,254 85	2,228 55	2,662 78
Denmark			2,388 98	1,292 47
Bremen				
Total	6,963,934 09	7,207,656 44	7,275,122 81	7,638,232 33

Comparison:
Increase of expenditures over year ended June 30, 1872, $2,426,753.36, or 9.10 per cent.
Increase of expenditures over year ended June 30, 1871, $4,694,841.59, or 19.24 per cent.

for the fiscal year ended June 30, 1873, *compared with the fiscal years ended June* 30, 1872, 30, 1871.

RECEIPTS.

Total year ended June 30, 1873.	Total year ended June 30, 1872.	Compared with year ended June 30, 1872.		Total year ended June 30, 1871.	Compared with year ended June 30, 1871.	
		Increase.	Decrease.		Increase.	Decrease.
$348,849 49	$345,868 58	$2,980 91	.....	$361,451 51	.....	$12,602 00
1,072,998 19	985,940 21	87,057 98	.....	909,015 72	$163,982 47	.....
1,150,042 38	1,086,895 50	63,146 88	.....	982,997 26	167,045 12	.....
3,917 39	18,616 63	.....	$14,699 24	2,816 38	1,101 01	.....
20,324,817 50	19,009,921 44	1,314,896 06	.....	17,747,389 05	2,577,428 45	.....
6,208 00	7,299 00	.....	1,091 00	10,596 51	.....	4,388 51
.....	36 18	.....	36 18	6,197 91	.....	6,197 91
21,324 62	17,451 20	3,873 42	.....	16,581 08	4,743 54	.....
68,584 00	443,397 63	.....	374,813 63	.....	68,584 00	.....
22,996,741 57	21,915,426 37	1,471,955 25	390,640 05	20,037,045 42	2,982,884 59	23,188 44
21,915,426 37	.....	390,640 05	.....	22,996,741 57	23,188 44	.....
1,081,315 20	.....	1,081,315 20	.....	2,959,696 15	2,959,696 15	.....

Comparison, excluding revenue from money-order business:
Increase of receipts over year ended June 30, 1872, $1,456,128.83, or 6.78 per cent.
Increase of receipts over year ended June 30, 1871, $2,891,112.51, or 14.42 per cent.

EXPENDITURES.

$5,725,468 12	$5,121,665 20	$603,802 92	.....	$5,028,381 85	$697,086 27	.....
4,257 96	7,011 06	.....	$2,753 10	10,716 45	.....	$6,458 49
16,833,682 58	15,547,820 53	1,285,862 05	.....	13,669,694 08	3,163,988 50	.....
23,494 49	28,683 68	.....	5,189 19	27,467 00	.....	3,972 51
6,368 57	6,535 58	.....	167 01	3,211 51	3,157 06	.....
81,412 60	53,112 33	28,300 27	.....	57,459 80	23,952 80	.....
170,227 20	191,174 00	.....	20,946 80	158,573 49	11,653 71	.....
7,500 00	9,177 52	.....	1,677 52	8,070 98	.....	570 98
38,377 30	28,169 07	10,208 23	.....	80,119 13	.....	41,741 83
157,963 26	131,776 47	26,186 79	.....	121,889 00	36,074 26	.....
2,978,614 24	2,785,253 63	193,360 61	.....	2,582,084 40	396,529 84	.....
653,921 76	535,828 84	118,092 92	.....	506,899 59	147,022 17	.....
1,422,990 69	1,385,965 76	37,024 93	.....	1,353,926 83	69,063 86	.....
.....	.....	.....	.....	.....	.....	.....
11,735 15	.....	11,735 15	.....	.....	11,735 15	.....
669,890 70	573,426 34	96,464 36	.....	530,723 71	139,166 99	.....
44,957 18	116,414 02	.....	71,456 84	178,088 05	.....	133,130 87
238,869 29	127,237 14	111,632 15	.....	66,722 16	172,147 13	.....
.....	.....	.....	.....	.....	.....	.....
11,533 13	8,941 14	2,591 99	.....	6,076 05	5,457 08	.....
3,681 45	.....	3,681 45	.....	.....	3,681 45	.....
.....	.....	.....	.....	.....	.....	.....
29,084,945 67	26,658,192 31	2,528,943 82	102,190 46	24,390,104 08	4,880,716 27	185,874 68
26,658,192 31	.....	102,190 46	.....	29,084,945 67	185,874 68	.....
2,426,753 36	.....	2,426,753 36	.....	4,694,841 59	4,694,841 59	.....

EDWARD W. BARBER,
Third Assistant Postmaster-General.

No. 5.—*Receipts and disbursements at Treasury*

Depositories.	Deposits.	Grants from Treasury.	By transfer.	Aggregate accumulation.	Aggregate receipts.
Treasurer U. S., Washington, D. C	$57,468 63		$413,963 22	$471,431 85	$57,468 63
Asst. treasurer U. S., Baltimore, Md	124,283 28		100,000 00	224,283 28	124,283 28
Asst. treasurer U. S., Boston, Mass	550,955 33		50,000 00	600,955 33	550,955 33
Asst. treasurer U. S., Charleston, S. C	47,536 30		166,000 00	213,536 30	47,536 30
Asst. treasurer U. S., Chicago, Ill	134 40			134 40	134 40
Asst. treasurer U. S., New Orleans, La	105,468 28		265,823 13	371,291 41	105,468 28
Asst. treasurer U. S., New York, N. Y	2,203,554 95	$4,590,475	150,000 00	6,944,029 95	6,794,029 95
Asst. treasurer U. S., Philadelphia, Pa	487,178 30			487,178 30	487,178 30
Asst. treasurer U. S., San Francisco, Cal.	254,750 16		50,000 00	304,750 16	254,750 16
Asst. treasurer U. S., Saint Louis, Mo	173,949 12		700,000 00	873,949 12	173,949 12
Designated depository, Buffalo, N. Y	468 93			468 93	468 93
Designated depository, Cincinnati, Ohio.					
Designated depository, Louisville, Ky	515 00			515 00	515 00
Designated depository, Mobile, Ala	29,752 81			29,752 81	29,752 81
Designated depository, Pittsburgh, Pa	3,483 89			3,483 89	3,483 89
First Nat'l Bank, Dubuque, Iowa	415 91			415 91	415 91
First Nat'l Bank, Galveston, Tex	426 96			426 96	426 96
First Nat'l Bank, Leavenworth, Kans	578 55			578 55	578 55
First Nat'l Bank, Memphis, Tenn	3,234 54			3,234 54	3,234 54
First Nat'l Bank, New Albany, Ind	177 00			177 00	177 00
First Nat'l Bank, Portland, Oreg	75 00			75 00	75 00
First Nat'l Bank, Richmond, Va	157 99			157 99	157 99
First Nat'l Bank, Srpingfield, Ill	132 18			132 18	132 18
First Nat'l Bank, Trenton, N. J	78 17			78 17	78 17
Second Nat'l Bank, Detroit, Mich	3,527 13			3,527 13	3,527 13
Second Nat'l Bank, Leavenworth, Kans.	156 70			156 70	156 70
Second Nat'l Bank, New Haven, Conn	500 00			500 00	500 00
Merchants' Nat'l Bank, Cleveland, Ohio.	1,017 99			1,017 99	1,017 99
Merchants' Nat'l Bank, Little Rock, Ark	551 33			551 33	551 33
Merchants' Nat'l Bank, Savannah, Ga	32,931 28			32,931 28	32,931 28
Atlanta Nat'l Bank, Atlanta, Ga	200 00			200 00	200 00
Indianapolis N'l Bank, Indianapolis, Ind	650 04			650 04	650 04
East Tenn. Nat'l Bank, Knoxville, Tenn.	114 44			114 44	114 44
National Bank of Lawrence, Kans	55 59			55 59	55 59
Lynchburgh N'l Bank, Lynchburgh, Va.	103 50			103 50	103 50
Raleigh Nat'l Bank, Raleigh, N. C	2,140 50			2,140 50	2,140 50
San Antonio N'l Bank, San Antonio, Tex	548 69			548 69	548 69
Planters' Nat'l Bank, Richmond, Va					
Second Nat'l Bank, Utica, N. Y					
Total	4,087,272 87	4,590,475	1,895,786 35	10,573,534 22	8,677,747 87

Comparative statement between fiscal years

Deposits for fiscal year of 1873		4,087,272 8
Deposits for fiscal year of 1872		4,072,864 7
Gain in deposits for 1873		14,408 11
Grants from the Treasury for 1872	$5,393,750 00	
Grants from the Treasury for 1873	4,590,475 00	
	803,275 00	
Deduct gain in deposits for 1873	14,408 11	
Aggregate receipts for 1872		9,466,614 76
Aggregate receipts for 1873		8,677,747 87
Loss to 1873 in receipts, occasioned by decrease in grants from the Treasury, which is, in fact, a gain	788,866 89	788,866 89
Decrease in receipts for 1873		878,528 08
Deduct increase in receipts for 1873		91,056 95
		787,471 13
Add amount of deposits made in 1872 at depositories with which there were no accounts for 1873		1,395 76
Loss to 1873, as shown above		788,866 89

depositories during fiscal year ended June 30, 1873.

Increase of receipts over 1872.	Decrease of receipts from 1872.	Warrants drawn.	Increase over 1872.	Decrease from 1872.	Transfer account.		Balance subject to draft, June 30, 1873.
					From—	To—	
.....	$35,398 79	$540,009 08	$194,701 10	.....	.....	$413,963 22	$294 50
.....	6,289 36	285,800 42	91,188 12	.....	$6,000 00	100,000 00	10,611 15
$32,679 39	.....	607,984 22	174,497 11	.....	150,000 00	50,000 00	36,140 09
.....	10,822 42	271,847 39	41,079 31	.....	.....	166,000 00	1,579 02
134 40	.....	.....	.....	.....	.....	.....	134 40
.....	22,556 79	492,118 28	.....	$5,127 64	.....	265,823 13	280 56
.....	759,063 46	5,660,764 87	117,103 95	.....	1,620,000 00	150,000 00	40,785 83
19,429 74	.....	573,465 01	94,305 04	.....	10,000 00	.....	23,369 89
24,094 55	.....	309,939 43	25,977 00	.....	.....	50,000 00	14,063 59
.....	1,425 91	967,809 15	312,794 97	.....	.....	700,000 00	21,731 49
.....	3,091 32	.....	.....	.....	3,839 88	.....	82 65
.....	50 00	.....	.....	.....	50 00	.....	.....
392 52	.....	.....	.....	.....	.....	.....	515 00
.....	12,518 83	.....	.....	1,399 51	35,771 99	.....	.....
2,323 00	.....	.....	.....	.....	3,031 38	.....	452 51
415 91	.....	.....	.....	.....	415 91	.....	.....
.....	2,210 29	.....	.....	.....	2,984 71	.....	79 50
475 81	.....	.....	.....	.....	578 55	.....	.....
636 52	.....	.....	.....	.....	2,655 98	.....	1,757 88
177 00	.....	.....	.....	.....	177 00	.....	.....
.....	681 00	.....	.....	.....	75 00	.....	.....
.....	5,187 67	.....	.....	.....	274 84	.....	.....
.....	7,084 38	.....	.....	.....	.....	.....	132 18
78 17	.....	.....	.....	.....	78 18	.....	.....
.....	8,658 64	.....	.....	.....	14,944 02	.....	.....
23 81	.....	.....	.....	.....	289 59	.....	.....
500 00	.....	.....	.....	.....	500 00	.....	.....
.....	340 62	.....	.....	.....	1,261 70	.....	544 29
.....	779 57	.....	.....	.....	551 33	.....	.....
6,168 52	.....	.....	.....	.....	37,261 48	.....	1,269 80
.....	1,694 20	.....	.....	.....	1,533 76	.....	.....
614 89	.....	.....	.....	.....	477 79	.....	172 25
114 44	.....	.....	.....	.....	114 44	.....	.....
55 59	.....	.....	.....	.....	.....	.....	55 59
53 50	.....	.....	.....	.....	103 50	.....	.....
2,140 50	.....	.....	.....	.....	2,140 50	.....	.....
548 69	.....	.....	.....	.....	.....	.....	548 69
.....	566 13	.....	.....	.....	566 13	.....	.....
.....	108 70	.....	.....	.....	108 70	.....	.....
91,056 95	878,528 08	9,709,737 85	1,051,640 55	6,527 15	1,895,786 35	1,895,786 35	154,600 86

of 1872 *and* 1873 *at Treasury depositories.*

Warrants drawn for 1873	$9,709,737 85	
Warrants drawn for 1872	8,664,624 45	
Increase of warrants for 1873		$1,051,640 55
Deduct decrease of warrants for 1873		6,527 15
Increase for 1873	1,045,113 40	1,045,113 40
Total number of warrants issued during fiscal year of 1873		8,005 00
Total number of warrants issued during fiscal year of 1872		6,706 00
Increase for 1873		1,299 00
Balance on hand June 30, 1872		1,175,258 77
Balance on hand June 30, 1873		154,600 86
Decrease for 1873		1,020,657 91

EDWARD W. BARBER,
Third Assistant Postmaster-General.

No. 6.—*Receipts and disbursements at depository post-offices on account fiscal year ended June* 30, 1873.

Office.	State.	Proceeds.	Deposits.	Collections.	Aggregate accumulation.	Amount subject to draft, June 30, 1872.	Total.	Disbursements.	Amount subject to draft, June 30, 1873.	Credit balance.
Albany	New York	$73,565 37	$67,187 65	.....	$140,753 02	$12,996 99	$153,750 01	$130,617 90	$23,132 11	.....
Atlanta	Georgia	32,217 07	13,822 88	$1,687 08	47,727 03	9,444 47	57,171 50	54,626 19	2,545 31	.....
Bangor	Maine	17,117 89	8,408 79	96 54	25,623 22	2,843 92	28,467 14	26,529 20	1,937 94	.....
Batavia	New York	3,547 90	380 43	52 78	3,981 11	1,448 01	5,429 12	4,690 74	738 38	.....
Binghamton	New York	15,443 13	3,450 59	.....	18,893 72	2,316 60	21,210 32	17,302 79	3,907 53	.....
Buffalo	New York	87,524 11	2,773 91	73 78	90,371 80	560 60	90,932 40	88,394 97	2,537 43	.....
Chicago *	Illinois	515,878 38	41,694 82	1,204 00	558,777 20	15,977 29	574,754 49	558,081 85	16,672 64	.....
Cincinnati *	Ohio	294,149 85	24,260 15	637 94	319,047 94	21,387 42	340,435 36	313,707 95	26,727 41	.....
Cleveland	Ohio	108,850 62	16,607 94	.....	125,458 56	5,967 93	131,426 49	117,357 96	14,068 53	.....
Columbus	Ohio	35,291 22	5,759 95	292 72	41,343 89	5,986 16	47,330 05	39,595 55	7,734 50	.....
Concord	New Hampshire	11,236 70	14,905 79	42 08	26,184 57	3,705 99	29,890 56	24,107 05	5,783 51	.....
Davenport	Iowa	20,019 57	4,088 41	.....	24,107 98	1,601 77	25,709 75	23,720 02	1,989 73	.....
Des Moines	Iowa	19,910 66	7,158 06	1,223 47	28,292 19	1,601 23	29,893 42	26,137 71	3,755 71	.....
Detroit	Michigan	127,592 14	8,303 64	56 72	135,952 50	16,407 10	152,359 60	128,082 32	24,277 28	.....
Dover	Delaware	1,645 83	1,009 87	104 22	2,759 92	318 85	3,078 77	2,789 03	289 74	.....
Dubuque	Iowa	18,628 43	14,936 44	316 39	33,881 26	1,068 09	34,949 35	31,303 81	3,645 54	.....
Easton	Pennsylvania	8,166 08	1,236 35	120 38	9,522 81	1,784 39	11,307 20	10,212 28	1,094 92	.....
Evansville	Indiana	13,996 47	4,983 55	65 56	19,045 58	2,550 28	21,595 86	17,467 71	4,128 15	.....
Fort Wayne	Indiana	15,858 95	3,666 92	139 01	19,664 88	3,956 66	23,621 54	19,424 32	4,197 22	.....
Geneva	New York	6,167 64	2,554 76	.....	8,722 40	3,506 09	12,228 49	7,615 38	4,613 11	.....
Grand Rapids	Michigan	22,740 08	6,055 02	1,606 51	30,401 61	3,621 19	34,022 80	29,108 76	4,914 04	.....
Harrisburgh	Pennsylvania	33,372 65	11,249 65	1,154 94	45,777 24	1,590 02	47,367 26	38,613 06	8,754 20	.....
Hartford	Connecticut	72,125 05	22,528 31	71 90	94,725 26	2,140 41	96,865 67	90,265 77	6,599 90	.....
Huntsville	Alabama	3,370 43	757 52	326 73	4,454 68	525 02	4,979 70	4,672 50	307 20	.....
Indianapolis	Indiana	60,183 95	12,805 52	68 05	73,057 52	6,763 55	79,821 07	77,246 72	2,574 35	.....
Kalamazoo	Michigan	7,291 64	3,912 93	269 47	11,474 04	3,719 62	15,193 66	13,360 67	1,832 99	.....
Keene	New Hampshire	5,600 47	1,160 68	198 66	6,959 81	2,562 91	9,522 72	6,378 00	3,144 72	.....
Knoxville	Tennessee	7,892 18	2,406 42	231 48	10,530 08	1,721 64	12,251 72	11,339 78	911 94	.....
La Fayette	Indiana	9,928 50	2,113 17	613 23	12,654 90	1,675 21	14,330 11	10,776 85	3,553 26	.....
Lancaster	New Hampshire	803 14	1,170 69	.....	1,973 83	873 09	2,846 92	2,294 19	552 73	.....
Leavenworth	Kansas	15,873 96	5,608 51	13,680 53	35,163 00	3,557 37	38,720 37	37,454 43	1,265 94	.....
Lexington	Kentucky	10,798 52	6,186 38	310 46	17,295 36	3,081 10	20,376 46	19,161 71	1,214 75	.....
Lima	Ohio	2,589 07	2,019 13	483 96	5,092 16	2,638 02	7,730 18	5,458 01	2,272 17	.....
Louisville	Kentucky	98,853 26	8,652 63	213 35	107,719 24	7,725 45	115,444 69	109,518 47	5,926 22	.....
Lowell	Massachusetts	27,595 32	2,052 70	.....	29,648 02	6,663 14	36,311 16	26,562 83	9,748 33	.....
Madison	Wisconsin	14,504 53	5,185 45	928 16	20,618 14	1,638 05	22,256 19	22,582 06	.....	$325 87
Meadville	Pennsylvania	6,524 92	31,437 54	286 90	38,249 36	3,088 16	41,337 52	39,897 60	1,439 92	.....
Memphis	Tennessee	64,288 71	24,341 84	2,599 52	91,230 07	5,986 76	97,216 83	93,258 79	3,958 04	.....
Milwaukee	Wisconsin	102,794 40	20,657 94	331 60	123,783 94	4,347 80	128,131 74	118,619 55	9,512 19	.....
Mobile †	Alabama	3,065 52	214 50	.....	3,280 02	.....	3,280 02	1,854 44	1,425 58	.....
Montpelier	Vermont	4,837 02	5,081 42	.....	9,918 44	968 72	10,887 16	9,481 44	1,405 72	.....
Nashville	Tennessee	28,770 84	11,234 12	1,100 36	41,105 32	1,801 26	42,906 58	42,505 40	401 18	.....
Newark	New Jersey	63,243 27	15,617 68	509 51	79,370 46	2,725 88	82,096 34	71,882 83	10,213 51	.....

New Haven	Connecticut	59,176 26	17,669 65	583 81	77,429 72	7,101 61	84,531 33	78,200 36	6,330 97	.....
Olean	New York	1,937 48	2,169 35	100 29	4,207 12	1,312 81	5,519 93	4,575 66	944 27	.....
Ogdensburgh	New York	6,835 12	2,128 91	51 86	9,015 89	524 78	9,540 67	7,982 42	1,558 25	.....
Peoria	Illinois	26,891 58	7,330 77	623 10	34,845 45	4,159 52	39,004 97	34,997 59	4,007 38	.....
Pittsburgh	Pennsylvania	147,395 93	28,347 88	5,269 90	181,013 71	12,362 79	193,376 50	183,566 42	9,810,08	.....
Plattsburgh	New York	3,765 33	1,897 32	128 97	5,791 62	1,311 03	7,102 65	4,939 90	2,162 75	.....
Portland	Maine	49,679 34	14,294 49	7,454 77	71,428 60	3,146 23	74,574 83	61,989 93	12,584 90	.....
Portsmouth	Ohio	6,408 75	6,904 11	1,181 19	14,494 05	2,589 34	17,083 39	16,099 08	984 31	.....
Providence	Rhode Island	102,926 37	17,357 41	29 62	120,313 40	12,731 16	133,044 56	115,152 77	17,891 79	.....
Quincy	Illinois	19,166 65	3,463 21	193 35	22,823 21	1,021 39	23,844 60	23,032 90	811 70	.....
Raleigh	North Carolina	9,636 85	3,830 83	342 99	13,810 67	1,811 39	15,622 06	13,906 73	1,715 33	.....
Richmond	Virginia	50,193 18	4,528 89	426 00	55,148 07	5,435 64	60,583 71	56,383 49	4,200 22	.....
Ripon	Wisconsin	1,982 78	466 83	80 74	2,530 35	891 17	3,421 52	2,759 50	662 02	.....
Rochester	New York	89,591 57	9,888 86	1,293 31	100,773 74	7,588 16	108,361 90	91,881 67	16,480 23	.....
Rutland	Vermont	5,421 87	3,553 78	43 39	9,019 04	2,014 89	11,033 93	9,300 79	1,733 14	.....
Saint Paul	Minnesota	42,262 93	31,246 97	1,223 31	74,733 21	2,371 47	77,104 68	71,066 39	6,038 29	.....
Sandusky	Ohio	6,785 09	1,197 89	370 97	8,353 95	1,953 52	10,307 47	9,759 89	547 58	.....
Scranton	Pennsylvania	13,272 35	29,406 66	520 06	43,199 07	3,717 23	46,916 30	42,651 90	4,264 40	.....
Springfield	Illinois	17,549 62	17,698 50	2,645 21	37,893 33	4,113 60	42,006 93	40,730 59	1,276 34	.....
Springfield	Massachusetts	39,045 37	18,316 54	.....	57,361 91	5,949 41	63,311 32	53,312 81	9,998 51	.....
Steubenville	Ohio	5,172 38	1,865 25	80 61	7,118 24	2,604 12	9,722 36	6,809 80	2,912 56	.....
Syracuse	New York	50,720 83	7,932 48	166 10	58,819 41	6,671 36	65,490 77	49,995 51	15,495 26	.....
Urbana	Ohio	4,575 26	553 70	33 40	5,162 36	850 89	6,013 25	5,068 78	944 47	.....
Utica	New York	36,270 27	9,916 17	152 37	46,338 81	5,384 86	51,723 67	42,306 64	9,417 03	.....
Vincennes	Indiana	1,619 56	1,897 85	248 81	3,766 22	751 39	4,517 61	4,510 15	7 46	.....
Wheeling	West Virginia	12,022 11	2,860 81	18 54	14,901 46	855 17	15,756 63	13,333 91	2,422 72	.....
Williamsport	Pennsylvania	14,013 03	2,400 93	74 41	16,488 37	3,142 11	19,630 48	17,160 80	2,469 68	.....
Wooster	Ohio	3,200 18	1,812 27	103 04	5,115 49	2,923 72	8,039 21	5,068 84	2,970 37	.....
Worcester	Massachusetts	49,554 05	16,969 83	264 91	66,788 79	5,591 93	72,380 72	63,290 88	9,089 84	.....
Zanesville	Ohio	12,512 64	1,897 30	125 78	14,535 72	3,206 17	17,741 89	13,161 18	4,580 71	.....
Miscellaneous	.....	.....	74,287 08	.....	74,287 08	.....	74,287 08	74,287 08	.....	.....
Total	.....	2,983,440 17	793,733 17	54,928 80	3,832,102 14	298,933 07	4,131,035 21	3,741,342 95	390,018 13	325 87

* Changed to a deposit office, June 30, 1873.

† Changed to a depository, April 25, 1873.

EDWARD W. BARBER,
Third Assistant Postmaster-General.

No. 7.—*Postage-stamps, stamped envelopes, newspaper-wrappers and postal cards issued during the year ended June* 30, 1873.

POSTAGE-STAMPS.

Quarter ended—	NUMBER AND DENOMINATIONS OF STAMPS.											Value.
	1-cent.	2-cent.	3-cent.	6-cent.	7-cent.	10-cent.	12-cent.	15-cent.	24-cent.	30-cent.	90-cent.	
September 30, 1872	25, 335, 200	11, 398, 900	100, 535, 000	2, 323, 250	166, 300	713, 210	270, 775	399, 000	35, 975	70, 220	8, 160	$3, 849, 124 00
December 31, 1872	21, 976, 000	14, 316, 900	109, 830, 000	2, 762, 250	394, 600	1, 098, 930	347, 600	457, 060	85, 200	129, 780	24, 330	4, 295, 798 00
March 31, 1873	26, 206, 100	17, 518, 700	109, 519, 800	3, 026, 250	270, 300	932, 230	324, 250	536, 440	84, 400	73, 320	7, 500	4, 360, 126 00
June 30, 1873	24, 335, 400	13, 158, 800	108, 729, 600	2, 589, 600	281, 100	673, 100	322, 925	502, 900	75, 425	71, 990	12, 750	4, 176, 141 00
Total	97, 852, 700	56, 393, 300	428, 614, 400	10, 701, 350	1, 112, 300	3, 417, 470	1, 265, 550	1, 895, 400	281, 000	345, 310	52, 740	16, 681, 189 00

STAMPED ENVELOPES AND NEWSPAPER-WRAPPERS—PLAIN.

Quarter ended—	NUMBER AND DENOMINATIONS OF ENVELOPES.										NEWSPAPER-WRAPPERS.		Value.
		2-cent.	3-cent.	6-cent.	7-cent.	10-cent.	12-cent.	15-cent.	24-cent.	30-cent.	90-cent.	1-cent.	2-cent.	
September 30, 1872		424, 000	12, 065, 050	53, 700	750	5, 000	250	250	.....	.....	.....	2, 932, 500	.....	$431, 281 00
December 31, 1872		830, 500	14, 254, 400	69, 050	1, 500	3, 750	250	.....	.....	.....	.....	3, 340, 250	.....	506, 275 00
March 31, 1873		515, 000	12, 329, 200	44, 450	.....	6, 500	250	250	250	250	250	3, 675, 750	.....	447, 863 00
June 30, 1873		510, 750	13, 111, 850	63, 300	750	3, 250	2, 850	250	250	250	.....	3, 908, 250	100, 000	477, 660 50
Total	10, 716, 250	2, 280, 250	51, 760, 500	230, 500	3, 000	18, 500	3, 600	750	600	500	250	13, 856, 750	100, 000	1, 863, 079 50

No. 7—*Postage-stamps, stamped envelopes, &c.*—Continued.

STAMPED ENVELOPES BEARING A REQUEST FOR THE RETURN OF UNCLAIMED LETTERS, ETC.

Quarter ended—	NUMBER AND DENOMINATIONS OF ENVELOPES.							Value.
	1-cent.	2-cent.	3-cent.	6-cent.	10-cent.	12-cent.	15-cent.	
September 30, 1872 .	183,000	229,500	12,368,750	35,000	.....	.....	.....	$379,582 50
December 31, 1872..	231,500	220,000	12,714,500	46,000	.....	500	.....	390,970 00
March 31, 1873	239,500	246,000	12,563,250	39,500	500	.....	500	386,707 50
June 30, 1873	204,750	249,000	12,585,000	43,500	.....	1,000	.....	387,307 50
Total.....	858,750	944,500	50,231,500	164,000	500	1,500	500	1,544,567 50

POSTAL CARDS.

Quarter ended—	Number of cards.	Value.
September 30, 1872	.....	.....
December 31, 1872.....	.....	.....
March 31, 1873	.....	.....
June 30, 1873	31,094,000	$310,940 00
Total.....	31,094,000	310,940 00

RECAPITULATION.

Description.	Whole number.	Value.
Postage-stamps	601,931,520	$16,681,189 00
Stamped envelopes—plain	65,014,600	1,722,512 00
Stamped envelopes—request.....	52,201,250	1,544,567 50
Newspaper-wrappers	13,956,750	140,567 50
Postal cards	31,094,000	310,940 00
Total.....	764,198,120	20,399,776 00

EDWARD W. BARBER,
Third Assistant Postmaster-General.

No. 8.—*Postage-stamps, stamped envelopes, newspaper-wrappers, and postal cards issued during the fiscal year ended June* 30, 1873.

Description.	Quarter ended September 30, 1872.	Quarter ended December 31, 1872.	Quarter ended March 31, 1873.	Quarter ended June 30, 1873.	Total.
Postage-stamps.					
One-cent	25,335,200	21,976,000	26,206,100	24,335,400	97,852,700
Two-cent	11,398,900	14,316,900	17,518,700	13,158,800	56,393,300
Three-cent	100,535,000	109,830,000	109,519,800	108,729,600	428,614,400
Six-cent	2,323,250	2,762,250	3,026,250	2,589,600	10,701,350
Seven-cent	166,300	394,600	270,300	281,100	1,112,300
Ten-cent	713,210	1,098,930	932,230	673,100	3,417,470
Twelve-cent	270,775	347,600	324,250	322,925	1,265,550
Fifteen-cent	399,000	457,060	536,440	502,900	1,895,400
Twenty-four-cent	35,975	85,200	84,400	75,425	281,000
Thirty-cent	70,220	129,780	73,320	71,990	345,310
Ninety-cent	8,160	24,330	7,500	12,750	52,740
Value	$3,849,124	$4,295,798	$4,360,126	$4,176,141	$16,681,189
Stamped envelopes and newspaper-wrappers, plain.					
One-cent	2,768,250	2,397,750	2,718,500	2,831,750	10,716,250
Two-cent	424,000	830,500	515,000	510,750	2,280,250
Three-cent	12,065,050	14,254,400	12,329,200	13,111,850	51,760,500
Six-cent	53,700	69,050	44,450	63,300	230,500
Seven-cent	750	1,500	.....	750	3,000
Ten-cent	5,000	3,750	6,500	3,250	18,500
Twelve-cent	250	250	250	2,850	3,600
Fifteen-cent	250	.....	250	250	750
Twenty-four-cent	.....	.....	250	250	500
Thirty-cent	.....	.....	250	250	500
Ninety-cent	.....	.....	250	.....	250
One-cent wrappers	2,932,500	3,340,250	3,675,750	3,908,250	13,856,750
Two-cent wrappers	.....	.....	.....	100,000	100,000
Value	$431,281 00	$506,275 00	$447,863 00	$477,660 50	$1,863,079 50
Stamped envelopes bearing a request to return.					
One-cent	183,000	231,500	239,500	204,750	858,750
Two-cent	229,500	220,000	246,000	249,000	944,500
Three-cent	12,368,750	12,714,500	12,563,250	12,585,000	50,231,500
Six-cent	35,000	46,000	39,500	43,500	164,000
Ten-cent	.....	.....	500	.....	500
Twelve-cent	.....	500	.....	1,000	1,500
Fifteen-cent	.....	.....	500	.....	500
Value	$379,582 50	$390,970 00	$386,707 50	$387,307 50	$1,544,567 50
Postal cards.					
One-cent	.....	.....	.....	31,094,000	31,094,000
Value	.....	.....	.....	$310,940 00	$310,940 00

RECAPITULATION.

Description.	Number.	Value.
Postage-stamps	601,931,520	$16,681,189 00
Stamped envelopes, plain	65,014,600	1,722,512 00
Stamped envelopes, request	52,201,250	1,544,567 50
Total stamped envelopes	117,215,850	3,267,079 50
Newspaper-wrappers	13,956,750	140,567 50
Postal cards	31,094,000	310,940 00
Whole number and value of stamps, stamped envelopes, wrappers, and postal cards	764,198,120	20,399,776 00

EDWARD W. BARBER,
Third Assistant Postmaster-General.

No. 9.—*Statement showing the increase in the issue of postage-stamps, stamped envelopes, newspaper-wrappers, and postal cards, for the year ending June 30, 1873, over the preceding year.*

Description.	1872.		1873.		Increase.		Per cent. increase.	
	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.
Postage-stamps	541,455,070	$15,840,649 00	601,931,520	$16,681,189 00	60,476,450	$840,540 00	11.17	5.31
Stamped envelopes, plain	58,276,500	1,663,196 50	65,014,600	1,722,512 00	6,738,100	59,315 50	11.56	3.56
Stamped envelopes, request	46,825,000	1,391,630 00	52,201,250	1,544,567 50	5,376,250	152,937 50	11.48	10.99
Newspaper-wrappers	8,824,250	175,152 50	13,956,750	140,567 50	5,132,500	*34,585 00	58.16	*19.75
Postal cards	.....	.....	31,094,000	310,940 00	31,094,000	310,940 00	.....	.....
Aggregate	655,380,820	19,070,628 00	764,198,120	20,399,776 00	108,817,300	1,329,148 00	16.60	6.97

* Decrease.

EDWARD W. BARBER,
Third Assistant Postmaster General.

No. 10.—*Statement showing the number of dead letters received and disposed of during the fiscal year ended June 30, 1873.*

Character of letters received.	Number received.	Actual or nominal value.	Delivered.		Filed for reclamation.		Outstanding or not acted on.		Destroyed.
			Number.	Value.	Number.	Value.	Number.	Value.	Number.
Domestic letters:									
Containing sums of $1 and upwards; also registered letters	15,649	$61,255 00	10,474	$42,326 40	2,371	$8,725 21	2,804	$10,203 79	.....
Containing sums of less than $1	15,399	4,643 91	4,668	1,569 18	2,709	779 98	8,022	2,294 75	.....
Containing checks, drafts, bills of exchange, &c.	22,312	5,729,864 80	20,996	5,334,027 69	772	123,488 14	544	272,348 97	.....
Containing jewelry, &c.	10,913	.....	6,987	.....	3,926	.....	.....	.....	.....
Containing photographs	42,903	.....	31,222	.....	11,681	.....	.....	.....	.....
Containing receipts, bills of lading, &c.	27,656	.....	26,011	.....	1,645	.....	.....	.....	.....
Containing postage and revenue stamps, &c.	44,489	.....	36,205	.....	8,284	.....	.....	.....	.....
Without inclosures	1,796,952	.....	1,421,125	.....	.....	.....	.....	.....	375,827
Containing circulars, &c., of no value whatever	2,157,655	.....	.....	.....	.....	.....	.....	.....	2,157,655
Total number of domestic letters	4,133,928	5,795,764 11	1,557,688	5,377,923 27	31,388	132,993 33	11,370	284,847 51	2,533,482
Foreign letters:									
Returned unopened	268,420	.....	268,420	.....	.....	.....	.....	.....	.....
Total both domestic and foreign	4,402,348	5,795,764 11	1,826,108	5,377,923 27	31,388	132,993 33	11,370	284,847 51	2,533,482

During the fiscal year there was received and deposited in the Treasury:

Unclaimed dead-letter money	$6,208 00	
Proceeds of sales of waste paper	$3,401 55	
Proceeds of sales of post-route maps	502 40	
Proceeds of sales of old carpets	239 56	
		4,143 51
Total		10,351 51

EDWARD W. BARBER,
Third Assistant Postmaster-General.

POST-OFFICE DEPARTMENT,
Contract-Office, Washington, D. C., October 29, 1873.

SIR: For a statement of the mail-service for the contract year ended June 30, 1873, &c., I have the honor to refer you to the tables hereto annexed:

Table A exhibits the character of the service, the length of routes, the number of miles of transportation, and the cost thereof, at the close of the contract year.

Table B exhibits the railroad-service as in operation on the 30th of June, 1873; also the cost per mile in each State.

Table C exhibits the steamboat-service as in operation on the 30th of June, 1873.

Table D shows the increase and decrease of mail transportation and cost in the several States and Territories during the year ended June 30, 1873.

Table E shows the weight of the mails, the speed with which they are conveyed, the accommodations for mails and agents, the trips per week, and the rates of pay per mile per annum on railroad routes in States (chiefly) in which the contract year expired June 30, 1873.

Table F shows the re-adjustment of the rates of pay per mile on certain railroad routes, and on certain new routes the adjustment of the rates, based upon returns of the weight of the mails, the speed with which they are conveyed, the accommodations provided for mails and agents, and the number of trips per week.

Table G is a statement of the number, description, and cost of mail-bags purchased by contract and put into service during the fiscal year ended June 30, 1873.

Table H shows the number and cost of mail locks and keys purchased and repaired during the year ended June 30, 1873.

Table I is a list of railway post-office lines in the United States June 30. 1873, showing the increase in the service since June 30, 1872.

Through-mail tables, from 1 to 32, show the time occupied in the transmission of mails on a number of the leading and most important routes of the country for the year ended with the month of September, 1873.

Very respectfully, your obedient servant,

JOHN L, ROUTT,
Second Assistant Postmaster-General.

Hon. J. A. J. CRESWELL,
Postmaster-General.

A.—*Table of mail-service for the year ended June 30, 1873, as exhibited by the state of the arrangements at the close of the year.*

[The entire service and pay on each route are set down to the State under which the route is numbered, though extending sometimes into other States, instead of being divided among the States in which the different portions lie.]

States and Territories.	Length of routes.	Annual transportation and cost.						Total annual transportation by celerity, certainty, and security.	Total annual transportation by steamboat.	Total annual transportation by railroad.	Total annual transportation.	Total annual cost.
		Celerity, certainty, and security.		By steamboat.		By railroad.						
	Miles.	*Miles.*	*Dollars.*	*Miles.*	*Dollars.*	*Miles.*	*Dollars.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Dollars.*
Maine	4,474	3,535	71,653	.....	.....	939	91,183	1,537,509	.....	779,609	2,317,118	162,836
New Hampshire	1,822	1,188	25,000	85	2,595	549	42,868	451,508	33,800	520,004	1,005,312	70,463
Vermont	2,348	1,695	42,505	.....	.....	653	79,850	826,955	.....	663,555	1,490,510	122,355
Massachusetts	2,720	996	51,733	30	2,500	1,694	220,608	704,827	18,720	2,546,631	3,270,178	274,841
Rhode Island	550	260	8,037	160	2,500	130	13,974	118,118	99,840	283,764	501,722	24,511
Connecticut	1,636	675	24,713	.....	.....	961	117,130	360,972	.....	1,483,513	1,844,485	141,843
New York	11,583	6,424	196,675	235	8,449	4,924	727,328	2,877,341	163,280	7,056,555	10,097,176	932,452
New Jersey	2,204	948	35,333	72	4,322	1,184	123,901	474,257	47,562	1,370,988	1,892,807	163,556
Pennsylvania	13,911	9,984	290,812	88	6,011	3,839	404,345	4,038,358	41,478	4,121,983	8,201,819	701,168
Delaware	439	201	6,405	.....	.....	238	18,172	93,704	.....	209,271	302,975	24,577
Maryland	2,981	1,890	67,169	40	750	1,051	225,015	1,049,464	24,960	1,886,536	2,960,960	292,934
West Virginia	4,975	4,411	53,924	250	14,564	314	28,542	867,204	108,888	195,964	1,172,056	97,030
Virginia	9,526	7,037	117,183	974	50,700	1,515	196,243	1,736,271	362,256	1,556,465	3,654,992	364,126
North Carolina	8,418	7,101	86,440	276	6,859	1,041	81,400	1,243,386	69,472	967,512	2,280,370	174,699
South Carolina	3,768	2,401	29,088	51	1,460	1,316	123,269	325,883	8,944	1,222,864	1,557,691	153,817
Georgia	5,809	3,514	52,493	224	4,894	2,071	163,924	548,002	39,416	2,400,470	2,987,888	221,311
Florida	6,204	2,318	32,955	3,442	137,848	444	26,452	317,670	341,600	304,268	963,538	197,255
Alabama	7,186	5,189	69,900	.....	.....	1,997	173,801	889,054	.....	1,503,644	2,392,698	243,701
Mississippi	5,390	3,886	70,058	497	9,500	1,007	128,932	709,582	51,688	749,234	1,510,504	208,490
Louisiana	4,587	2,943	121,474	1,124	82,405	520	66,114	718,126	301,808	467,366	1,487,300	269,993
Texas	12,419	10,654	464,538	598	78,000	1,167	91,390	2,512,314	190,597	804,239	3,507,150	633,928
Arkansas	8,476	7,028	212,558	1,314	77,593	134	13,400	1,639,188	308,880	97,820	2,045,888	303,551
Missouri	13,481	9,701	205,028	450	21,000	3,330	363,235	2,651,266	265,200	3,001,867	5,918,333	589,263
Tennessee	6,007	4,635	65,806	155	9,250	1,217	145,591	950,382	62,400	1,143,897	2,156,679	220,647
Kentucky	7,364	5,077	95,357	1,058	51,000	1,229	116,293	1,277,488	477,622	1,134,770	2,889,880	262,650
Ohio	11,991	6,835	153,266	279	12,834	4,877	778,855	2,294,328	103,069	5,619,518	8,016,915	944,955
Indiana	7,613	4,713	77,902	.....	.....	2,900	287,548	1,194,268	.....	3,104,489	4,298,757	365,450
Illinois	11,335	5,293	107,420	.....	.....	6,042	683,839	1,537,500	.....	6,663,759	8,201,259	791,259
Michigan	9,369	5,076	112,024	996	26,765	3,297	309,006	1,398,425	194,536	3,484,596	5,077,557	447,795
Wisconsin	8,357	6,181	111,873	184	2,170	1,992	183,363	1,708,209	35,737	1,936,115	3,680,061	297,406
Iowa	9,575	6,304	123,602	.....	.....	3,271	254,875	1,743,461	.....	2,611,630	4,355,091	378,477
Minnesota	7,284	5,435	110,631	.....	.....	1,849	118,548	1,278,290	.....	1,569,097	2,847,387	229,179
Nebraska	3,755	2,364	51,888	.....	.....	1,391	302,036	633,620	.....	977,122	1,610,742	353,924

Kansas	7,317	4,935	125,918	.....	.....	2,382	237,321	1,437,228	.....	1,669,104	3,106,332	363,239
Nevada	2,136	2,084	180,112	.....	.....	52	3,741	758,494	.....	32,292	790,786	183,853
California	10,878	7,166	526,032	2,081	92,000	1,631	298,093	2,411,445	362,544	1,287,818	4,061,807	916,125
Oregon	2,415	2,183	65,097	232	31,000	.....	.....	368,960	126,360	.....	495,320	96,097
Washington Territory	3,345	1,478	116,780	1,867	62,676	.....	.....	350,876	107,128	.....	458,004	179,456
Idaho Territory	1,175	1,175	105,509	.....	.....	.....	.....	346,880	.....	.....	346,880	105,509
Montana Territory	1,381	1,381	114,306	.....	.....	.....	.....	512,320	.....	.....	512,320	114,306
Dakota Territory	1,154	1,093	24,396	.....	.....	61	4,611	217,602	.....	38,364	255,966	29,007
Wyoming Territory	163	163	11,541	.....	.....	.....	.....	39,416	.....	.....	39,416	11,541
Utah Territory	2,939	2,903	371,258	.....	.....	36	1,825	1,469,118	.....	22,776	1,491,894	373,083
Colorado Territory	2,406	2,194	180,294	.....	.....	212	10,575	771,507	.....	131,976	903,483	190,869
New Mexico Territory	1,812	1,812	319,417	.....	.....	.....	.....	692,348	.....	.....	692,348	319,417
Arizona Territory	1,532	1,532	92,397	.....	.....	.....	.....	257,296	.....	.....	257,296	92,397
Total	256,210	175,991	5,578,500	16,762	799,645	63,457	7,257,196	50,340,420	3,947,785	65,621,445	119,909,650	13,635,341

Railway post-office clerks	970,800
Route-agents	828,240
Mail-route messengers	106,740
Local agents	82,896
Mail-messengers	536,441
Baggage-masters in charge of registered packages	576
Aggregate	16,161,034

JOHN L. ROUTT,
Second Assistant Postmaster-General.

B.—*Railroad service as in operation on the 30th of June, 1873.*

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	MAINE.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
1	Augusta to Skowhegan	Portland and Kennebec	39		6	2,925 00		75 00	
9	Danville Junction to Bangor	Maine Central	110		6	13,750 00		125 00	
9a	Newport to Dexter	do	14		6	840 00		60 00	
19	Farmington to Brunswick	Androscoggin	66½ 5		6 12	5,412 50		75 00 75 00	$50 per annum included for mail-messenger service at Lisbon.
84	Calais to Princeton	Lewy's Island	21		6	2,100 00		100 00	
114	Portland to Portsmouth, N. H	Portland, Saco and Portsmouth	52		18	9,137 50		175 72	$1,300 per annum included for railway post-office car.
115	Portland to Augusta Branch to Bath	Portland and Kennebec	73			8,275 00		113 35	6 times a week for 5 months. 12 times a week for 7 months.
116	Portland to Canada line	Grand Trunk	48 117		12 6	17,700 00		125 00 100 00	
117	Portland to Rochester, N. H	Portland and Rochester	52		6	2,888 77		55 55	$420 per annum additional for mail-messenger service.
163	Mechanic's Falls to Canton	Portland and Oxford Central	27.5		6	1,246 57		45 33	
181	Bangor to New Brunswick line	European and North American	118.25		6	14,781 25		125 00	
188	Old Town to Guilford	Bangor and Piscataquis	48.1		6	2,405 00		50 00	
201	Belfast to Burnham Village	Maine Central	34.19		6	1,709 50		50 00	
202	Portland to North Conway, N. H	Portland and Ogdensburgh	61⅝		12	3,697 50		60 00	
204	Bath to Rockland	Knox and Lincoln	49		12	4,165 00		85 00	
214	Houlton to New Brunswick line	New Brunswick and Canada	3		6	150 00		50 00	
				939.165			91,183 59		
	NEW HAMPSHIRE.								
251	Concord to Nashua	Concord	36		18	5,400 00		150 00	
253	Concord to Wells River	Boston, Concord and Montreal	50.75 42.25		12 6	9,300 00		100 00 100 00	
254	Concord to White River Junction. Branch to Bristol	Northern	69 13		12 6	11,160 00		140 00 50 00	$850 per annum included for mail-messenger service.
255	Concord to Claremont Junction	Concord and Claremont	54.99		6	3,172 42		57 69	
256	Concord to Portsmouth	Concord	60		12	3,000 00		50 00	
269	Manchester to North Weare	do	20.5		6	1,025 00		50 00	
278	Nashua to Wilton	Boston and Lowell and Nashua and Lowell.	16		12	900 00		56 25	

299	Contocook Village to Hillsborough Bridge.	Contoocook River	15		6	750 00		50 00		
308	Dover to Alton Bay	Boston and Maine	28		6	1,400 00		50 00		
309	Brock's Crossing to North Conway	Portsmouth, Great Falls and Conway.	6		12	3,505 50		50 00		
			64.11		7			50 00		
331	Groveton Junction to Wells River.	Boston, Concord and Montreal	53.1		6	2,655 00		50 00		
342	Hooksett to Pittsfield	Suncook Valley	20		6	600 00		30 00		
				548.7			42,867 92			
	VERMONT.									
412*	Burlington to Rouse's Point	Vermont Central and Vermont and Canada.	32.5		15	9,712 50		175 00		
			23		6			175 00		
452	White River Junction to Derby Line.	Connecticut and Passumpsic Rivers.	114.17		6	11,417 00		100 00		
461	Windsor to Burlington	Vermont Central	119		15	20,825 00		175 00		
475	Rutland to State Line; Branch to Bennington	Harlem Extension	59		6	2,950 00		50 00		
481	Bellows Falls to Windsor	Sullivan	25		12	3,500 00		140 00		
482	Bellows Falls to Burlington	Rutland and Burlington	52		6	20,405 00		100 00	$3,000 per annum included for mail-messenger service.	
			67.5		18			180 81		
487	Brattleborough to Bellows Falls	Vermont Valley	24		12	3,360 00		140 00		
508	Saint Albans to Canada line	Vermont and Canada	17		6	1,700 00		100 00		
520	Saint Albans to Richford	Vermont Central and Vermont and Canada.	28.66		6	1,433 00		50 00		
521	West Concord to Hyde Park	Portland and Ogdensburgh	59.56		6	2,978 00		50 00		
523	Richford to Newport	Missisquoi and Clyde Rivers	31.38		6	1,569 00		50 00		
				652.77			79,849 50			
	MASSACHUSETTS.									
601	Boston to Portsmouth, N. H.	Eastern	56.5		31	11,300 00		200 00		
602	Boston to South Berwick Junction, Me.	Boston and Maine	75		12	11,400 00		150 00		
	Branch to Great Falls, N. H.		3		12			50 00		
603	Boston to Nashua, N. H.	Boston and Lowell and Nashua and Lowell.	42		21	6,300 00		150 00		
604	Boston to Fitchburgh	Fitchburgh	52		18	9,100 00		175 00		
605	Boston to Albany, N. Y	Boston and Albany	45		43	68,475 00		375 00		
			56		25			375 00		
			102		18			300 00		
606	Boston to Woonsocket Falls, R. I.	Boston, Hartford and Erie	4		25	2,380 00		60 00		
			35.68		12			60 00		
607	Boston to Southbridge	do	70		12	6,300 00		90 00		
608	Boston to Providence, R. I.	Boston and Providence	44		25	8,800 00		200 00		
609	Boston to Plymouth	Old Colony and Newport	38		12	5,645 00		125 00	$895 per annum included for mail-messenger service.	
610	Boston to Medford	Boston and Maine	5.5		6	275 00		50 00		
615	Boston to Mattapan	Old Colony and Newport	8.5		12	768 00		50 00	$343 per annum included for mail-messenger service.	
616	Boston to West Lynn Depot	Eastern	10		12	500 00		50 00		
617	Boston to Dedham	Boston and Providence	11		12	550 00		50 00		

B.—*Railroad service as in operation on the 30th of June*, 1873—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	MASSACHUSETTS—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
618	Grafton Depot to Millbury	Boston and Albany	4		12	200 00		50 00	
619	Salem to Gloucester	Eastern	16		12	800 00		50 00	
620	Salem to Marblehead	do	4		6	200 00		50 00	
621	Salem to Lawrence	do	20		6	1,000 00		50 00	
622	Georgetown to Haverhill	Boston and Maine	6.5		6	325 00		50 00	
627	Lawrence to Manchester	Manchester and Lawrence	28		12	2,800 00		100 00	
629	Lowell to Lawrence	Boston and Lowell and Nashua and Lowell.	14		21	1,050 00		50 00	$350 per annum included for mail-messenger service.
631	Winchester to Woburn	Boston and Lowell and Nashua and Lowell.	3		12	150 00		50 00	
632	Porter's Station to Lexington	Lexington and Arlington	8		12	400 00		50 00	
635	North Acton Depot to Hudson	Fitchburgh	9		12	500 00		50 00	$50 per annum included for mail-messenger service.
636	Ayer to Lowell	Boston and Lowell and Nashua and Lowell.	17		15	850 00		50 00	
637	Ayer to Mason Village	Fitchburgh	23		6	1,150 00		50 00	
638	Auburndale Station to Newton Lower Falls.	Boston and Albany	2		6	100 00		50 00	
639	Natick to Saxonville	do	4		12	200 00		50 00	
640	South Framingham to Pratt's Junction.	Boston, Clinton and Fitchburgh	29		18	2,175 00		75 00	
641	South Framingham to Milford	Boston and Albany	12		18	900 00		50 00	$300 per annum included for mail-messenger service.
650	Canton Depot to Stoughton	Stoughton Branch	4		12	250 00		50 00	$50 per annum included for mail-messenger service.
654	South Braintree Junction to Newport.	Old Colony and Newport	61.75		12	7,105 00		100 00	$930 per annum included for mail-messenger service.
655	South Abington to Bridgewater	do	7.75		6	380 00		38 70	$80 per annum included for mail-messenger service.
656	Braintree Depot to Cohasset	South Shore	12		12	1,304 00		50 00	$704 per annum included for mail-messenger service.
663	Middleborough to Hyannis	Cape Cod	47		12	6,500 00		117 00	$1,000 per annum included for mail-messenger service.
670	Yarmouthport to Wellfleet	do	31		12	5,800 00		100 00	$2,700 per annum included for mail-messenger service.
672	New Bedford to West Wareham	New Bedford and Taunton	16.25		12	1,093 75		55 00	$200 per annum included for mail-messenger service.

676	Taunton to Middleborough	Middleborough and Taunton	9.50		12	475 00		50 00		
677	Taunton to Mansfield Junction	Taunton Branch	12		24	1,800 00		125 00		$300 per annum included for mail-messenger service.
678	Taunton to New Bedford	New Bedford and Taunton	20.50		25	2,355 00		85 00		$612.50 per annum included for mail-messenger service.
683	Worcester to Nashua	Worcester and Nashua	46.25		18	4,625 00		100 00		
688	Sterling Junction to Fitchburgh	Boston, Clinton and Fitchburgh	14		18	1,050 00		75 00		
689	Fitchburgh to Bellows Falls	Cheshire and Ashuelot	64		18	7,500 00		117 18		
690	Fitchburgh to Brattleborough, Vt. Miller's Falls to Hoosac Tunnel. Branch to Turner's Falls	Vermont and Massachusetts	113		6	11,300 00		100 00		
696	Palmer to Miller's Falls	New London Northern	35		12	2,625 00		75 00		
702	Springfield to South Vernon Junction.	Connecticut River	50		15	6,550 00		125 00		$300 per annum included for side-supply of Chicopee Falls.
703	South Vernon Junction to Keene, N. H.	Cheshire and Ashuelot	24		6	1,200 00		50 00		
721	Pittsfield to North Adams	Pittsfield and North Adams	21		12	1,575 00		60 00		$315 per annum included for mail-messenger service.
727	Gloucester to Pigeon Cove	Eastern	5 1.50		12 6	450 00		50 00 50 00		$125 per annum included for mail-messenger service.
728	Wakefield to Newburyport	Boston and Maine	30.50		6	1,525 00		50 00		
731	South Braintree Junction to Fall River.	Old Colony and Newport	34		6	1,700 00		50 00		
732	East Salisbury to Amesbury	Eastern	4		12	250 00		62 50		
723	Palmer to Gilbertville	New London Northern	15.75		6	775 00		50 00		
735	Mansfield to South Framingham	Boston, Clinton and Fitchburgh	22		6	1,100 00		50 00		
738	Winchendon to Peterborough, N. H.	Monadnock	16		6	800 00		50 00		
741	Palmer to Athol Depot	Athol and Enfield	35.34		6	1,767 00		50 00		
742	South Framingham to Lowell	Boston, Clinton and Fitchburgh	29		6	1,450 00		50 00		
745	Worcester to Gardner	Boston, Barre and Gardner	27		6	1,350 00		50 00		
746	Holyoke to Westfield	New Haven and Northampton	10.53		12	526 50		50 00		
748	Milford to Bellingham Junction	Providence and Worcester	5		12	250 00		50 00		
749	Milford to Ashland	Hopkinton	11.68		6	584 00		50 00		
				1,694.39			220,608 25			
	RHODE ISLAND.									
801	Providence to Worcester, Mass.	Providence and Worcester	44		24	4,800 00		75 00		$1,500 per annum included for mail-messenger service.
802	Providence to New London, Conn.	New York, Providence and Boston.	63.75		22	7,986 75		125 00		
803	Providence to Bristol	Providence, Warren and Bristol	15.50		12	855 00		55 16		
821	Warren to Fall River, Mass.	Fall River, Warren and Providence	7		12	350 00		50 00		
				130.25			13,973 75			
	CONNECTICUT.									
925	Norwich to Worcester, Mass.	Norwich and Worcester	60		12	5,046 00		75 00		$546 per annum included for agent in charge of extra night mail.
926	New London to Palmer, Mass.	New London Northern	30 35		12 18	5,625 00		100 00 75 00		
932	Middletown to Berlin Depot	Hartford and New Haven	10		18	1,000 00		75 00		$250 per annum included for mail messenger service.

B.—*Railroad service as in operation on the 30th of June*, 1873—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	CONNECTICUT—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
936	New Haven to New London	New York and New Haven	50		23	7,567 00		150 00	$67 per annum included for mail-messenger service.
937	New Haven to Springfield, Mass.	Hartford and New Haven	63 5-6		31	20,745 83		325 00	
938	New Haven to Williamsburgh, Mass. Branch to New Hartford	New Haven and Northampton	83 16		12 18	8,425 00		75 00 75 00	$1,000 per annum included for mail-messenger service.
939	New Haven to York	New York and New Haven	76⅓		31	28,625 00		375 00	$50 per mile per annum included for railway post-office cars.
942	Bridgeport to Winsted Branch to Watertown	Naugatuck	62 5¾		12 12	5,701 25		85 00 75 00	
943	Bridgeport to State Line, Mass. Branch to Pittsfield	Housatonic	126½		12	10,120 00		80 00	
945	South Norwalk to Danbury Branch to Ridgefield Branch to Hawleyville	Danbury and Norwalk	23½ 4 6.01		12 12 12	2,420 50		85 11 30 00 50 00	
955	Waterbury to Providence, R. I.	Hartford, Providence and Fishkill.	122½		12	12,250 00		100 00	
972	Vernon Depot to Rockville	Rockville	4⅝		12	500 00		50 00	$268.50 per annum included for mail-messenger service.
975	New Haven to Middletown	New Haven, Middletown and Willimantic.	24		6	1,200 00		50 00	
976	Hartford to New Saybrook	Valley	43.16		6	2,158 00		50 00	
977	New Haven to Ansonia	New Haven and Derby	13½		12	675 00		50 00	
980	Hartford to Millerton	Connecticut Western	69.18		6	3,459 00		50 00	
981	Litchfield to Hawleyville	Shepaug Valley	32¼		12	1,612 50		50 00	
				961 17-120			117,130 08		
	NEW YORK.								
1001	New York to Middletown Middletown to Hornellsville Hornellsville to Salamanca Salamanca to Dunkirk	Erie	67 265 82 46		34½ 20½ 19 13	172,500 00		375 00	
1002	New York to Troy	Hudson River	150		25	56,250 00		375 00	
1003	New York to Chatham Village	New York and Harlem	130½		6	13,050 00		100 00	Old rate of pay.
1004	New York to Manhasset	Flushing and North Side	13 8¾		12 6	2,400 00		110 55 110 55	Side-service included.

1005	Stapleton to Tottenville	Staten Island	21		12	1,800 00		85 71	Do.
1006	New York to Greenport	Long Island	67½ 33		12 6	12,050 00		100 00 100 00	$2,000 per annum included for mail-messenger service in New York.
1007	Mineola to Locust Valley	do	12¼		12	862 50		50 00	$250 per annum included for side-service.
1008	Hicksville to Northport	do	16½		12	1,250 00		50 00	$425 per annum included for side-service.
1009	Suffern to Piermont	Erie	18		6	900 00		50 00	
1010	Newburgh to Chester Branch, Vail's Gate to junction with main stem.	do	19¾ 12¼		6 6	1,625 00		50 00 50 00	
1011	Hudson to West Stockbridge, Mass.	Hudson and Boston	35		12	1,750 00		50 00	
1012	Albany to Albany Junction	Rensselaer and Saratoga	9 3		18 12	1,029 00		85 73 85 73	
1013	Albany to Binghamton	Delaware and Hudson Canal	142		12	14,200 00		100 00	
1014	Central Bridge to Schoharie	Schoharie Valley	5		18	400 00		80 00	
1015	Schenectady to Ballston	Rensselaer and Saratoga	16		12	800 00		50 00	
1016	Troy to Schenectady	New York Central	22		18	1,650 00		75 00	Old rate of pay.
1017	Troy to North Adams, Mass. Branch to State Line, Mass	Troy and Boston	50 5½		18 6	6,937 50		125 00 125 00	
1018	Troy to Saratoga Springs	Rensselaer and Saratoga	32.81		12	4,921 50		150 00	
1019	Eagle Bridge to Rutland, Vt.	do	62½		12	9,375 00		150 00	
1020	Saratoga Springs to Castleton, Vt.	do	54		12	8,100 00		150 00	
1021	Plattsburgh to Canada Line	Montreal and Plattsburgh	23			1,725 00		75 00	12 times a week, 8 months; 6 times a week, 4 months.
1022	Rouse's Point to Ogdensburgh	Ogdensburgh and Lake Champlain	119		12	10,710 00		90 00	Side-service included.
1023	Rouse's Point to Canada Line	Champlain and Saint Lawrence	2.25		6	262 50		116 66	
1024	Watertown to Cape Vincent	Rome, Watertown and Ogdensburgh.	26		12	1,300 00		50 00	
1025	Utica to Carthage	Utica and Black River	35 39.5		12 6	5,050 84		67 80 67 80	
1026	Rome to Ogdensburgh Branch to Potsdam Junction	Rome, Watertown and Ogdensburgh.	72 70 25		24 12 6	19,205 00		115 00 115 00 115 00	
1027	Syracuse to Rochester	New York Central	104		21	13,000 00		125 00	
1028	Syracuse to Binghamton	Syracuse, Binghamton and New York.	80		12	7,200 00		90 00	
1029	Syracuse to Oswego	Oswego and Syracuse.	35.5		12	2,662 50		75 00	
1030	Canandaigua to Niagara Falls	New York Central	97		12	4,850 00		50 00	
1031	Canandaigua to Elmira	Northern Central	68.5		12	10,275 00		150 00	
1032	Rochester to Avon	Erie	18		6	1,350 00		75 00	
1033	Avon to Dansville	do	30.73		12	1,824 00		59 37	
1034	Suspension Bridge to Detroit, Mich	Great Western Railroad Company of Canada.	229		25	11,450 00		50 00	
1035	Attica to Corning	Erie	111		24	33,300 00		300 00	
1036	Buffalo to Lockport	New York Central	22		12	1,100 00		50 00	
1037	Buffalo to Lewiston	do	29		6	2,175 00		75 00	
1038	Buffalo to Hornellsville	Erie	91		12	34,125 00		375 00	
1039	Buffalo to Erie, Pa	Lake Shore and Michigan Southern	89		31	33,375 00		375 00	
1040	Owego to Ithaca	Delaware, Lackawanna and Western.	35		12	3,000 00		85 71	

B.—*Railroad service as in operation on the 30th of June*, 1873—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	NEW YORK—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
1041	Chesterville to Warwick	Warwick Valley	11		12	550 00		50 00	
1042	Oswego to Richland	Rome, Watertown and Ogdensburgh	28.5		12	1,645 00		50 00	$220 per annum included for side-service.
1043	Brocton to Corry, Pa	Buffalo, Corry and Pittsburgh	45.3		6	2,865 00		50 00	$600 per annum included for side-service.
1044	New York to Patchogue	South Side	55		12	3,400 00		50 00	$550 per annum included for side-service, and $100 per annum for supply of Bellport and Fireplace.
1045	Goshen to Montgomery	Erie	10.25		9	400 00		39 02	
1046	Skaneateles Junction to Skaneateles	Skaneateles	5.5		18	350 00		63 33	
1079	Albany to Buffalo	New York Central	298		25	111,750 00		375 00	
1181	Watertown to Carthage	Carthage, Watertown and Sackett's Harbor.	18.22		12	911 00		50 00	
1228	Utica to North Norwich	Delaware, Lackawanna and Western.	48.5		6	2,425 00		50 00	
1282	Rochester to Niagara Falls	New York Central	76		12	19,000 00		250 00	
1338*a*	Fredonia to Dunkirk Station	Dunkirk and Fredonia	3.5		18	400 00		114 28	
1405	Chenango Forks to Norwich	Delaware, Lackawanna and Western.	30.69		6	1,534 50		50 00	
1451*a*	Middletown to Unionville	Middletown, Unionville and Water Gap.	14		6	500 00		35 71	
1454	Utica to Smith's Valley Station	Utica, Clinton and Binghamton	31.4		6	1,570 00		50 00	
1509	Buffalo to Emporium	Buffalo and Washington	123.51		6	6,175 50		50 00	
1510	Schoharie to Middleburgh	Middleburgh and Schoharie Valley	5.5		12	395 00		50 00	$120 per annum included for mail-messenger service.
1518	Plattsburgh to Au Sable Forks	Whitehall and Plattsburgh	23		6	1,000 00		43 47	
1524	Chatham Village to Bennington, Vt	Harlem Extension	57.8		6	3,468 00		60 00	
1525	Cooperstown to Cooperstown Junction.	Cooperstown and Susquehanna Valley.	16		12	1,000 00		62 50	
1540	Oswego to Walton	New York and Oswego Midland	148.98		12	7,449 00		50 00	
1541	Newburgh to Millerton	Dutchess and Columbia	56.50		6	3,050 00		50 00	
	Branch to Sylvan Lake		4.50		6			50 00	
1542	Athens to Fair Haven	Southern Central	122		6	6,600 00		50 00	$500 per annum included for side-service.
1543	Montgomery to Kingston	Wallkill Valley	33.46		6	1,003 80		30 00	

1544	Cobleskill to Cherry Valley	Delaware and Hudson Canal	22.47		12	1,123 50		50 00	
1545	Cassville Junction to Richfield Springs.	Delaware, Lackawanna and Western.	21		6	1,050 00		50 00	
1546	Sidney Plains to New Berlin	New York and Oswego Midland	24.84		6	1,242 00		50 00	
1560	Johnsonville to Greenwich	Greenwich and Johnsonville	14		12	600 00		42 85	
1561	Fonda to Gloversville	Fonda, Johnstown and Gloversville	10		12	700 00		70 00	Side-service included.
1562	Canastota to Cazenovia	Cazenovia and Canastota	15		12	750 00		50 00	
1563	Poughkeepsie to Boston Corner	Poughkeepsie and Eastern	37.15		6	1,857 50		50 00	
1564	Port Jervis to Monticello	Monticello and Port Jervis	24		6	1,200 00		50 00	
1565	Middletown to Ellenville Branch to Liberty Falls	New York and Oswego Midland	22.75 28.75		6 6	2,575 00		50 00	Do.
1566	Ithaca to Cortland Village	Ithaca and Cortland	22		12	1,100 00		50 00	
1567	Goshen to Pine Island	Goshen and Deckertown	11		6	250 00		22 18	Do.
1568	Golden Bridge to Mahopac	New York and Harlem	7.50		6	375 00		50 00	
1569	Norwich to Cortland Village	New York and Oswego Midland	49.21		6	2,460 50		50 00	
1574	Buffalo to Suspension Bridge	Erie	25.94		12	1,297 00		50 00	
1576	Rondout to Stamford	Rondout and Oswego	73.30		12	3,665 00		50 00	
1577	Syracuse to Lacona	Syracuse Northern	44.92		12	2,246 00		50 00	
1579	Ithaca to State Line	Ithaca and Athens	34.60		6	1,730 00		50 00	
1580	Dunkirk to Titusville, Pa	Dunkirk, Warren and Pittsburgh	91.16		6	4,558 00		50 00	
1581	Syracuse to Earlville	Syracuse and Chenango Valley	42.47		12	2,123 50		50 00	
1582	Port Henry to Leicester Junction, Vt.	Vermont Central and Vermont and Canada.	31.50		6	1,575 00		50 00	
1585	Clinton to Rome	New York and Oswego Midland	13.75		12	687 50		50 00	
1586	Walton to Delhi	do	16		12	800 00		50 00	
1587	East Gainesville to Perry	Rochester and Pine Creek	6.55		12	327 50		50 00	
1589	Cayuga to Aurora	Cayuga Lake	12.25		12	612 50		50 00	
1590	Sodus Point to Gorham Station	Sodus Point and Southern	34		6	1,700 00		50 00	
1591	Horseheads to Erin	Utica, Ithaca and Elmira	8.55		12	427 50		50 00	
1592	Oswego to Sodus	Lake Ontario Shore	40.75		6	2,037 50		50 00	
1593	Carthage to Theresa	Utica and Black River	20.50		6	1,025 00		50 00	
				4,924.31			727,328.07		
	NEW JERSEY.								
2101	New York to Easton, Pa	Central Railroad Company of New Jersey.	74		19	22,200 00		300 00	
2102	Somerville to Flemington	do	16.06		6	690 00		43 00	
2103	New York to New Brunswick	Pennsylvania	36		25	13,500 00		375 00	Old rate of pay.
2104	New Brunswick to Philadelphia	do	54		25	20,250 00		375 00	Do.
2105	Philadelphia to South Amboy Branch to Trenton	do	66 6		12 12	7,462 00		103 64	Do.
2106	New York to Easton, Pa	Delaware, Lackawanna and Western.	63 24.47		12 6	7,520 00		100 00	Do.
2107	Camden to Atlantic City	Camden and Atlantic	60		12	3,000 00		50 00	
2108	New York to Nyack	Northern Railroad Company of New Jersey.	30		6	2,158 00		50 00	$658 per annum included for side-service.
2109	Philadelphia to Hightstown Branch to Burlington	Pennsylvania	25 27 7		12 6 12	4,000 00		75 00 50 00 50 00	Old rate of pay; $400 per annum, included for mail-messenger service.

B.—*Railroad service as in operation on the 30th of June*, 1873—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	NEW JERSEY—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
2110	Philadelphia to Bridgeton	West Jersey	18 20.40		18 12	4,440 00		100 00 100 00	$600 per annum included for mail-messenger service in Philadelphia.
2111	Glassborough to Millville	do	22		12	2,200 00		100 00	
2112	Millville to Cape May	do	41			3,075 00		75 00	6 times a week, 8 months; 12 times a week, 4 months.
2113	Elmer to Salem	do	16.6		12	1,000 00		60 24	
2114	Mount Holly to Medford	Pennsylvania	6.5		6	325 00		50 00	Old rate of pay.
2115	Jamesburgh to Freehold	Freehold, Jamesburgh and Agricultural.	11.45		6	860 00		66 37	$100 per annum included for mail-messenger service.
2116	Trenton to Belvidere	Pennsylvania	68.70		12	5,152 50		75 00	
2117	Lambertville to Flemington	do	12.13		12	606 50		50 00	
2118	Greensburgh Station to Pennington	do	5.6		12	280 00		50 00	
2119	New York to New Bridge	Hackensack and New York	16.5		12	825 00		50 00	Old rate of pay.
2120	New Bridge to Nanuet Junction	Erie	13.25		6	662 50		50 00	
2121	Waterloo to Franklin Furnace Branch to Branchville	Sussex	12 12.76 6.24		12 6 6	1,650 00		50 00 50 00 50 00	$100 per annum included for side-service on branch.
2122	New York to Denville	Delaware, Lackawanna and Western.	35.93		12	1,796 50		50 00	Old rate of pay.
2123	Dover to Chester	do	10		6	500 00		50 00	Do.
2124	Newark to Mont Clair	Newark and Bloomfield	5.67		12	275 00		48 60	Do.
2125	Rocky Hill to Monmouth Junction	Pennsylvania	8		6	400 00		50 00	Do.
2126	New York to Pemberton Junction Branch, Eatontown to Port Monmouth. Branch, Manchester to Barnegat Junction.	New Jersey Southern	41.2 23.9 9.8 20.3		12 6 12 12	6,387 50		75 00 75 00 75 00 75 00	
2127	Whiting to Atco	do	33.3		6	1,665 00		50 00	
2128	Newark to Paterson	Erie	13.12		12	656 00		50 00	
2129	Atsion to Greenwich	Vineland	44.25		6	1,770 00		40 00	
2130	Whiting to Tuckerton	Tuckerton	29.56		6	1,478 00		50 00	
2131	Kinkora to New Lisbon	Pennsylvania	14.41		6	720 50		50 00	
2132	New York to Unionville	New York and Oswego Midland	69.75		6	3,487 50		50 00	
2133	Bridgeton to Port Norris	Bridgeton and Port Norris	20.24		6	1,257 20		30 00	$650 per annum included for side-service.
2134	Egg Harbor City to May's Landing.	May's Landing and Egg Harbor City.	7.43		12	371 50		50 00	

2149	Summit to Bernardsville	New Jersey West Line	14.60		6	730 00		50 00	
2209	Woodbury to Swedesborough	West Jersey	11		6	550 00		50 00	
				1,184.66			123,901 20		
	PENNSYLVANIA.								
2401	Philadelphia to Pittsburgh	Pennsylvania	353.6		8	132,600 00		375 00	
2402	Philadelphia to Pottsville	Philadelphia and Reading	92.5		12	11,562 50		125 00	
2403	Philadelphia to West Chester	West Chester and Philadelphia	26.13		18	2,062 50		75 00	$102.75 per annum included for side-service.
2404	Philadelphia to Bethlehem	North Pennsylvania	54.6		42	6,195 00		100 00	
	Branch, Landsdale to Doylestown		9.8		18			75 00	
2405	Philadelphia to Norristown	Philadelphia and Reading	16.24		12	812 00		50 00	
2406	Philadelphia to Darby	Philadelphia and Darby	5		6	500 00		100 00	Six additional half-trips to Darby.
2407	Bridgeport to Downingtown	Philadelphia and Reading	21.48		6	537 00		25 00	
2408	Chester to Port Deposit	Philadelphia and Baltimore Central	59.25		12	4,443 75		75 00	
2409	Honesdale to Lackawaxen	Erie	25		6	1,875 00		75 00	
2410	Allentown to Waverly	Lehigh Valley	189.5		18	18,950 00		100 00	
2411	Penn Haven Junction to Mount Carmel.	do	50		6	2,000 00		40 00	Six additional half-trips from Mahanoy City to Penn Haven.
2412	Penn Haven Junction to Audenreid.	do	17.5		12	1,050 00		60 00	
2413	Pottsville to Herndon	Philadelphia and Reading	81.1		6	4,055 00		50 00	Six additional half-trips from Pottsville to Tamaqua.
2414	Port Clinton to Williamsport	do	121.53		6	7,899 45		65 00	
2415	Sunbury to Tomhicken	Pennsylvania	44.1		6	2,205 00		50 00	
2416	Hazle Creek Bridge to Tomhicken	Lehigh Valley	25.2		12	1,890 00		75 00	Six additional half-trips from Hazel Creek Bridge.
2417	Scranton to Northumberland	Lackawanna and Bloomsburgh	17.01		12	6,000 00		75 00	
			62.99		6			75 00	
2418	Scranton to Carbondale	Delaware and Hudson Canal and Railroad.	17.11		12	1,200 00		50 00	$344.50 per annum included for mail-messenger service.
2419	Binghamton, N. Y., to New Hampton, N. J.	Delaware, Lackawanna and Western.	144.5		6	11,560 00		80 00	
2420	Blossburgh to Corning, N. Y	Tioga	39.88		12	2,991 00		75 00	
	Branch to Fall Brook		6.85		12			50 00	
	Branch to Morris Run		3.80		6	722 00		50 00	
	Branch to Arnot		3.79		6			50 00	
2421	Williamsport to Elmira, N. Y	Northern Central	78		12	13,650 00		175 00	
2422	Sunbury to Erie	Pennsylvania	222.1		12	30,750 00		150 00	On 39.8 miles.
			65.5		18			100 00	On 247.8 miles.
2423	Sunbury to Mount Carmel	Northern Central	28		6	1,400 00		50 00	
2424	Alton to Carrollton	Erie	25.5		6	1,020 00		40 00	
2425	Irvine to Corry	Allegheny Valley	14.8		12	6,569 00		55 00	On 50.2 miles.
			36		6				
			17		18			85 00	On 45.4 miles.
			27.8		24				
2426	Strasburgh to Leaman Place	Herr and Company	4.25		6	250 00		58 83	
2427	Lancaster to Middletown	Pennsylvania	31.2		12	2,340 00		75 00	
2428	Harrisburgh to Auburn	Philadelphia and Reading	58.3		6	2,332 00		40 00	

B.—*Railroad service as in operation on the 30th of June*, 1873—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	PENNSYLVANIA—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
2429	New Castle to Homewood	Pittsburgh, Fort Wayne and Chicago.	15		6	750 00		50 00	
2430	Harrisburgh to Hagerstown	Cumberland Valley	18.5		18	6,300 00		100 00	On 52 miles.
			44.75		12			50 00	On 22 miles.
			10.75		6				
2431	Columbia to Sinking Springs	Reading and Columbia	39.7		6	2,375 00		50 00	
	Branch Junction to Lancaster		7.8		12			50 00	
2432	York to Columbia	Pennsylvania	13.5		12	675 00		50 00	
2433	Hanover Junction to Frederick, Md.	Hanover Branch	50.4		6	2,520 00		50 00	
2434	Hanover to Gettysburgh	Susquehanna, Gettysburgh and Potomac.	17.5		12	1,050 00		60 00	
2435	Huntingdon to Mount Dallas Station.	Huntingdon and Broad Top	44		6	3,000 00		60 00	
	Branch, Saxton to Dudley		6		6			60 00	
2436	Tyrone to Clearfield	Pennsylvania	40.6		6	2,436 00		60 00	
2437	Altoona to Martinsburgh	——do	22.3		18	1,600 00		50 00	
	Branch, Duncanville to Newry		3		12			50 00	
	Branch, Martinsburgh Junction to Henrietta.		6.7		6			50 00	
2438	Cresson to Ebensburgh	——do	11		12	550 00		50 00	
2439	Tyrone to Lockhaven	——do	55.1		12	3,468 00		60 00	
	Branch, Milesburgh to Bellefonte		2.7		12				
2440	Blairsville to Allegheny	——do	29.3		12	3,822 00		60 00	
			34.4		6				
2441	Washington to Wheeling, W. Va.	Hempfield	32		12	1,977 00		50 00	$377 per annum included for side-service.
2442	Pittsburgh to Oil City	Allegheny Valley	132.71		12	11,280 35		85 00	
2443	Branch Junction to Indiana	Pennsylvania	19		12	1,045 00		55 00	
2444	Meadville to Oil City	Great Western	36.25		12	2,718 75		75 00	
2445	Miles Grove to Newcastle	Erie and Pittsburgh	83		12	6,640 00		80 00	
2446	Oil City to Ashtabula, Ohio	Lake Shore and Michigan Southern.	87.9		6	4,354 50		50 00	
2447	Bethlehem to Chapman Quarries	Lehigh and Lackawanna	15		12	750 00		50 00	
2448	Downington to Honey Brook	Pennsylvania	18		6	900 00		50 00	
2449	West Chester to Intersection	West Chester	9		6	250 00		27 77	
2450	Junction to Milroy	Pennsylvania	12.5		6	625 00		50 00	
2451	Pottsville to Frackville	Philadelphia and Reading	8.51		6	425 50		50 00	

2452	Greenville to Harrisville	Shenango and Allegheny	33.5		6	1,675 00		50 00		
2453	Carlisle to Mountain Creek	South Mountain Iron Company	18		6	450 00		25 00		
2454	Freeport to Butler	Pennsylvania	21.3		12	1,065 00		50 00		
2455	Wilmington, Del., to Reading, Pa	Wilmington and Reading	63.6		6	2,544 00		40 00		
2456	Pittsburgh to Washington	Pittsburgh, Cincinnati and Saint Louis.	22.8		6	1,368 00		60 00		
2457	Perkiomen Junction to Green Lane	Philadelphia and Reading	17.92		6	716 80		40 00		
2458	Pottstown to Colebrookdale	do	13.05		6	522 00		40 00		
2459	Oleopolis to Pit-Hole City	Pit-Hole Valley	7		6	210 00		30 00		
2460	Lebanon to Tower City	Philadelphia and Reading	43.1		6	1,293 00		30 00		
2461	Towanda to Bernice	Sullivan and Erie Coal and Railroad Company.	29.32		6	1,172 80		40 00		
2462	Schulykill Haven to Glen Carbon	Philadelphia and Reading	13.2		12	528 00		40 00		
2463	Topton to Kutztown	do	4.36		6	218 00		50 00		
2464	Pittsburgh to Cumberland, Md.	Pittsburgh and Connellsville	147.8		6	8,440 00		50 00		
	Branch Broad Top to Mount Pleasant.		9		6			50 00		
	Branch, Connellsville to Uniontown.		12		6			50 00		
2465	Carbondale to Susquehanna Depot	Erie	38.25		6	1,912 50		50 00		
2466	Lawrenceville to Antrim	Fall Brook Coal Company	37.1		12	2,442 50		65 84		
2467	Phœnixville to Eagle	Philadelphia and Reading	11.12		6	556 00		50 00		
2468	Lewisburgh to Mifflinburgh	Pennsylvania	10.7		12	535 00		40 00	$107 per annum included for mail-messenger service.	
2469	Lewistown Junction to Sunbury	do	45		6	1,800 00		40 00		
2470	Union City to Titusville	Allegheny Valley	14.1		6	564 00		40 00		
2471	Towanda to Barclay	Towanda Coal Company	12		6	480 00		40 00		
2472	Shaff's Bridge to Somerset	Somerset and Mineral Point	9.1		6	655 00		50 00	$200 per annum included for mail-messenger service.	
2474	Marion Junction to Mercersburgh	Cumberland Valley	21.44		6	1,072 00		50 00	Pay estimated.	
2475	Mount Dallas Station to Cumberland, Md.	Pennsylvania	47.60		6	2,856 00		60 00		
2476	Allentown to Harrisburgh	Philadelphia and Reading	90		18	27,000 00		300 00		
2477	Conshohocken to Flourtown	do	7.25		6	362 50		50 00	Do.	
2479	Easton to Allentown	Lehigh Valley	16.58		35	4,974 00		300 00		
				3,839.16			404,345 40			
	DELAWARE.									
3401	Wilmington to Delmar, Md.	Philadelphia, Wilmington and Baltimore.	96.92		12	10,621 25		109 59		
3402	Delmar to Crisfield, Md	Eastern Shore	38		6	2,375 00		62 50		
3403	Clayton to Easton, Md	Maryland and Delaware	44		6	2,200 00		50 00		
3404	Harrington to Lewes	Junction and Breakwater	40		6	2,000 00		50 00		
3405	Wilmington to Landenburgh, Pa	Wilmington and Western	19.53		6	976 50		50 00	Do.	
				238.45			18,172 75			
	MARYLAND.									
3501	Baltimore to Philadelphia	Philadelphia, Wilmington and Baltimore.	100		52	37,700 00		375 00		
	Branch, Perryville to Port Deposit		4		12			50 00		

B.—*Railroad service as in operation on the 30th of June*, 1873—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	MARYLAND—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
3502	Baltimore to Sunbury, Pa	Northern Central	140. 7		12	42, 210 00		300 00	
3503	Baltimore to Washington	Baltimore and Ohio	40		48	15, 000 00		375 00	
3504	Baltimore to Wheeling, W. Va	do	377		18	107, 445 00		285 00	
3505	Araby to Frederick	do	3		18	300 00		100 00	
3506	Weaverton to Hagerstown	do	24. 25		6	1, 212 50		50 00	
3507	Lake Roland to Hagerstown	Western Maryland	81. 4		6	6, 105 00		75 00	
3508	Annapolis to Annapolis Junction	Annapolis and Elk Ridge	20. 5		12	1, 537 50		75 00	
3509	Cambridge to Seaford, Del	Dorchester and Delaware	33. 5		6	1, 675 00		50 00	
3510	Salisbury to Berlin	Wicomico and Pocomoke	23		6	1, 150 00		50 00	
3511	Townsend, Del., to Centreville, Md.	Queen Anne's and Kent	36		6	1, 800 00		50 00	
3512	Cumberland to Piedmont, W. Va	Cumberland and Pennsylvania	34		6	1, 700 00		50 00	
3513	Mussey's Cross Roads to Chestertown.	Kent County	19. 55		6	1, 466 25		75 00	
3514	Baltimore to Washington	Baltimore and Potomac	42. 60		6	2, 130 00		50 00	Pay estimated.
3515	Bowie to Pope's Creek	do	48. 68		6	2, 434 00		50 00	Do.
3516	Newtown Junction to Newtown	Worcester and Somerset	9		6	450 00		50 00	
3517	Berlin to Snow Hill	Worcester	14		6	700 00		50 00	
				1, 051. 18			225, 015 25		
	WEST VIRGINIA.								
4101	Harper's Ferry to Strasburgh, Va.	Baltimore and Ohio	51⅛		6	2, 581 25		100 00	
4102	Grafton to Parkersburgh	do	104		6	18, 200 00		175 00	
4189	Laurel Junction to Volcano	Laurel Fork and Sand Hill	8		6	240 00		30 00	
4293	Hutington to Hinton	Chesapeake and Ohio	150. 42		6	7, 521 00		50 00	
				314. 045			28, 542 25		
	VIRGINIA.								
4401	Game Point to Richmond	Richmond, Fredericksburgh and Potomac.	75. 5		13	15, 100 00		200 00	
4403	Alexandria to Lynchburgh Branch to Warrenton	Orange, Alexandria and Manassas	171 9		14 14	38, 925 00		225 00 50 00	
4404	Alexandria to Hamilton	Washington and Ohio	45		6	2, 250 00		50 00	
4405	Manassas to Harrisonburgh	Orange, Alexandria and Manassas	111		6	6, 660 00		60 00	
4406	Richmond to Hinton, W. Va	Chesapeake and Ohio	272. 58		6	27, 258 00		100 00	
4407	Richmond to Greensborough, N. C.	Richmond and Danville	190. 5		14	23, 812 50		125 00	
4408	Richmond to West Point	Richmond and York River	40		6	1, 000 00		25 00	

4409	Richmond to Petersburgh	Richmond and Petersburgh	24½		14	4,900 00		200 00
4410	Petersburgh to Weldon, N. C	Petersburgh	65		14	13,102 00		200 00
4411	Petersburgh to City Point	Atlantic, Mississippi and Ohio	12		6	600 00		50 00
4412	Petersburgh to Norfolk	do	81½		6	4,075 00		50 00
4413	Petersburgh to Lynchburgh	do	123		6	6,150 00		50 00
4414	Lynchburgh to Bristol, Tenn	do	205		14	46,125 00		225 00
4415	Portsmouth to Weldon, N. C	Seaboard and Roanoke	80		6	6,000 00		75 00
4701	Glade Spring to Saltville	Atlantic, Mississippi and Ohio	9½		6	285 00		30 00
				1,515.08			196,242 50	
	NORTH CAROLINA.							
5001	Raleigh to Weldon	Raleigh and Gaston	97		7	7,275 00		75 00
5002	Weldon to Wilmington	Wilmington and Weldon	162½		14	24,337 50		150 00
	Branch, Rocky Mount to Tarborough.		17		7	608 00		35 76
5003	Wilmington to Wadesborough	Wilmington, Charlotte and Rutherford.	141		7	7,050 00		50 00
5004	Goldsborough to Charlotte	Richmond and Danville	130		12	22,300 00		82 11
			93		12			125 00
5005	Goldsborough to Morehead City	Atlantic and North Carolina	95		7	5,225 00		55 00
5006	Salisbury to Old Fort	Western North Carolina	114		6	5,700 00		50 00
5007	Charlotte to Buffalo Paper Mill	Western Division Wilmington, Charlotte and Rutherford.	52½		6	2,625 00		50 00
5213	Charlotte to Statesville	Atlantic, Tennessee and Ohio	48.4		6	1,936 00		40 00
5216	Raleigh to Sandford	Raleigh and Augusta Air-Line	45.78		7	2,289 00		50 00
5216	Sandford to Fayetteville	Western	38.15		7	1,907 50		50 00
5216	Sandford to Egypt Depot	do	7		2	147 00		21 00
				1,041.08			81,400 00	
	SOUTH CAROLINA.							
5601	Charlotte, N. C., to Augusta, Ga	Charlotte, Columbia and Augusta	195		13	24,375 00		125 00
5602	Columbia to Greenville C. H	Greenville and Columbia	143½		6	11,400 00		75 00
	Branch, Hodges to Abbeville C. H		11½		6			30 00
	Branch, Belton to Anderson C. H		9¾		6			30 00
5604	Columbia to Wilmington, N. C.	Wilmington, Columbia and Augusta.	82.08		14	24,663 00		100 00
			109.70		14			150 00
5605	Kingsville to Augusta, Ga	South Carolina	119		7	23,020 00		125 00
	Branch, Kingsville to Camden		37½		7			50 00
	Branch, Kingsville to Columbia		27		7			60 00
	Br., Branchville to Charleston		62		7			75 00
5606	Charleston to Savannah, Ga	Savannah and Charleston	104		7	13,000 00		125 00
5607	Charleston to Florence	Northeastern	104		13	13,000 00		125 00
5608	Florence to Cheraw	Cheraw and Darlington	40		7	2,000 00		50 00
5609	Chester C. H. to Yorkville	King's Mountain	23½		6	1,175 00		50 00
5610	Alston to Spartanburgh C. H	Spartanburgh and Union	70		3	2,800 00		40 00
5611	Newberry C. H. to Laurens C. H	Joseph Crews	31.52		3	1,200 00		38 07
5612	Anderson C. H. to Walhalla	Greenville and Columbia	34		6	1,020 00		30 00
5707	Port Royal to Augusta, Ga	Port Royal	112.32		7	5,616 00		50 00
				1,316.37			123,269 00	

B.—*Railroad service as in operation on the 30th of June*, 1873—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	GEORGIA.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
6001	Augusta to Atlanta	Georgia	171⅔		13	21,458 33		125 00	
6002	Atlanta to Chattanooga, Tenn.	Western and Atlantic	138		7	17,250 00		125 00	
6003	Atlanta to West Point	Atlanta and West Point	86.25		7	10,781 25		125 00	
6004	Millen to Augusta	Central Railroad and Banking Co.	53⅓		14	6,640 62		125 00	
6005	Washington to Double Wells	Georgia	18.50		7	925 00		50 00	
6006	Union Point to Athens	do	41		7	3,075 00		75 00	
6007	Kingston to Rome	Rome	20.50		7	1,025 00		50 00	
6008	Savannah to Live Oak, Fla	Atlantic and Gulf	180.75		7	23,350 00		100 00	
	Branch, Lawton to Bainbridge		105.50		7			50 00	
6009	Savannah to Macon	Central Railroad and Banking Co.	192⅓		21	21,133 75		110 00	
6010	Macon to Columbus	Southwestern	100		13	7,500 00		75 00	
6011	Macon to Atlanta	Macon and Western	103		14	10,300 00		100 00	
6012	Macon to Brunswick	Macon and Brunswick	198		7	9,900 00		50 00	
6013	Gordon to Milledgeville	Central Railroad and Banking Co.	18.25		6	912 50		50 00	
6014	Eatonton to Milledgeville	do	22⅛		6	1,106 00		50 00	
6015	Fort Valley to Eufaula, Ala	Southwestern	115⅔		13	10,760 00		75 00	
	Branch, Renwick to Albany		22.50		7			50 00	
	Branch, Cuthbert to Fort Gaines		24		7			40 00	
6016	Thomasville to Albany	Atlantia and Gulf	58⅓		7	2,916 00		50 00	
6017	Atlanta to Gainesville	Atlanta and Richmond Air-Line	53.50		6	2,675 00		50 00	Pay estimated.
6143	Barnesville to Thomaston	Macon and Western	17.25		6	690 00		40 00	
6144	Cartersville to Rock Mart	Cherokee	22		6	660 00		30 00	
6145	Camac to Macon	Macon and Augusta	79		6	3,950 00		50 00	
6146	Griffin to Sharpsburgh	Savannah, Griffin & North Alabama	35.75		6	1,072 50		30 00	
6191	Brunswick to Albany	Brunswick and Albany	171.25		6	5,137 50		30 00	
6231	Columbus to Hamilton	North and South	23.51		6	705 30		30 00	
				2,071.55			163,923 75		
	FLORIDA.								
6401	Fernandina to Cedar Keys	Florida	47.40		12	7,740 00		50 00	
			107.40		6			50 00	
6402	Jacksonville to Quincy	Jacksonville, Pensacola and Mobile	196.75		6	14,756 25		75 00	
	Branch, Tallahassee to St. Mark's		21.75		3	652 50		30 00	
6404	Pensacola to Whiting Junction, Ala	Pensacola and Louisville	44		7	2,200 00		50 00	
6405	Tocoi to Saint Augustine	Saint John's	15.69		6	784 50		50 00	

6406	Pensacola to Millview	Pensacola and Perdido	10.62	443.61	6	318 75	26,452 00	30 00	
	ALABAMA.								
6601	Montgomery to West Point, Ga	Western Railroad Co. of Alabama	88.50		6	11,062 50		125 00	
6602	Montgomery to Selma	do	50		6	2,500 00		50 00	
6603	Montgomery to Eufaula	Montgomery and Eufaula	81.24		6	4,062 00		50 00	
6604	Montgomery to Decatur	South and North Alabama	182.85		7	9,142 50		50 00	Do.
6605	Memphis, Tenn., to Stevenson, Ala.	Memphis and Charleston	271.50		13	40,725 00		150 00	
	Branch, Moscow, Tenn., to Somerville, Ala.		14.50		6	435 00		30 00	
	Branch, Tuscumbia to Florence.		6.50		7	325 00		50 00	
6606	Marion Junction to Sawyerville	Selma, Marion and Memphis	45.12		6	2,256 00		50 00	
6607	Opelika to Columbus, Ga	Western Railroad Company of Alabama.	98		6	2,100 00		75 00	
6608	Columbus, Ga., to Troy, Ala	Mobile and Girard	90		6	4,500 00		50 00	
6609	Selma to York Station	Alabama Central	81.70		7	6,127 50		75 00	
6610	Selma to Dalton, Ga	Selma, Rome and Dalton	237.50		6	23,750 00		100 00	
6611	Gainesville to Gainesville Junction, Miss.	Mobile and Ohio	22		6	1,100 00		50 00	
6612	Mobile to Montgomery	Mobile and Montgomery	179		7	28,640 00		160 00	
6613	Mobile to New Orleans, La	New Orleans, Mobile and Texas	140		7	15,400 00		110 00	
6614	Opelika to Buffalo	East Alabama and Cincinnati	22.50		6	675 00		30 00	
6615	Chattanooga, Tenn., to Meridian, Miss.	Alabama and Chattanooga	290		7	14,500 00		50 00	
6616	Opelika to Dadeville	Savannah and Memphis	30.58		6	917 40		30 00	
6617	Selma to Pine Apple	Selma and Gulf	40.75		6	2,037 50		50 00	
6618	Mobile to Jackson	Mobile and Alabama Grand Trunk	60.70		6	1,821 00		30 00	
6619	Chehaw to Tuskegee	Tuskegee	6		6	300 00		50 00	
6620	Atalla to Gadsden	East Alabama and Cincinnati	6		6	300 00		50 00	
6621	Eufaula to Clayton	Vicksburgh and Brunswick	22.50		6	1,125 00		50 00	
				1,997.44			173,801 40		
	MISSISSIPPI.								
7001	Canton to Jackson, Tenn	Southern Railroad Association	237		7	47,400 00		200 00	
7002	Memphis, Tenn., to Grenada, Miss.	Mississippi and Tennessee	101.70		7	8,136 00		80 00	
7003	Vicksburgh to Meridian	Vicksburgh and Meridian	45.50		13	11,690 00		100 00	
			95.20		7			75 00	
7004	Mobile, Ala., to Columbus, Ky.	Mobile and Ohio	472.70		7	59,087 50		125 00	
	Branch, Artesia to Columbus, Miss.		14		7	840 00		60 00	
7006	Grand Gulf to Port Gibson	Grand Gulf and Port Gibson	8		6	600 00		75 00	
7007	Muldon to Aberdeen	Mobile and Ohio	9		6	450 00		50 00	
7008	Middleton Station, Tenn., to Ripley	Ripley	24.30		6	729 00		30 00	
				1,007.40			128,932 50		
	LOUISIANA.								
8001	New Orleans to Brashear	Morgan's Louisiana and Texas	83		7	12,850 00		150 00	$400 per annum included for side-service.

B.—*Railroad service as in operation on the 30th of June*, 1873—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile of each route.	Remarks.
	LOUISIANA—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
8002	New Orleans to Canton, Miss.....	New Orleans, Jackson and Great Northern.	206	.....	13	41,200 00	.....	200 00	
8003	Baton Rouge to Livonia.....	Baton Rouge, Grosse Tête and Opelousas.	28	.....	3	360 00	.....	12 86	
8004	Clinton to Port Hudson	Clinton and Port Hudson	21	.....	3	630 00	.....	30 00	
8005	Vicksburgh, Miss., to Monroe, La.	North Louisiana and Texas.....	75.5	.....	7	6,162 50	.....	75 00	$500 per annum included for ferriage and mail-messenger service.
8028	Saint Francisville to Woodville, Miss.	West Feliciana	27.57	.....	3	964 95	.....	35 00	
8090	New Orleans to Donaldsonville	New Orleans, Mobile and Texas ..	63.66	.....	6	3,183 00	.....	50 00	
8098	Terre Bonne to Houma.....	Morgan's Louisiana and Texas....	15.28	.....	6	764 00	.....	50 00	
				520.01			66,114.45		
	TEXAS.								
8502	Houston to Galveston	Galveston, Houston and Henderson.	50	.....	12	8,000 00	.....	160 00	
8503	Houston to Colbert's Ferry	Houston and Texas Central.....	340.35	.....	6	34,035 00	.....	100 00	
8504	Harrisburgh to Columbus	Galveston, Harrisburgh and San Antonio.	84	.....	6	8,400 00	.....	100 00	
8505	Hempstead to Austin.....	Houston and Texas Central.....	118.7	.....	6	11,870 00	.....	100 00	
8506	Longview to Shreveport, La.....	Texas and Pacific.....	66.6	.....	6	5,328 00	.....	80 00	
8577*a*	Bremond to Waco.....	Waco and Northwestern. (Operated by Houston and Texas Central.)	44.56	.....	6	2,896 40	.....	65 00	
8666	Hearne to Longview.....	International	171.52	.....	6	8,576 00	.....	50 00	
8683	Houston to Tyler.....	Houston and Great Northern.....	224.50	.....	6	8,925 00	.....	50 00	46 miles covered by route 8666.
8684	Indianola to Cuero.....	Gulf, Western Texas and Pacific..	67.2	.....	6	3,360 00	.....	50 00	
				1,167.43			91,390 40		

	ARKANSAS.								
7501	Memphis, Tenn., to Argenta	Memphis and Little Rock	134	134	7	13,400 00	13,400 00	100 00	
	MISSOURI.								
10501	Saint Louis to Atchison, Kans	Pacific Railroad Co. of Missouri	285.50 44.25		12 12	65,807 50		215 00 100 00	
10502	Saint Louis to Columbus, Ky Branch, Mineral Point to Potosi Br'ch, Bismarck to Argenta, Ark.	Saint Louis and Iron Mountain and Cairo and Fulton.	197 4 262		13 6 6	33,000 00		100 00 50 00 50 00	
10503	Pacific to Vinita, Ind. T	South Pacific	327.25		6	32,725 00		100 00	
10504	Saint Louis to Kansas City	North Missouri	170 107		6 6	35,100 00		175 00 50 00	
10505	Quincy, Ill., to Saint Joseph, Mo. Branch, Palmyra to Hannibal	Hannibal and Saint Joseph	203.50 15		12 12	38,237 50		175 00 175 00	
10506	Kansas City to Council Bluffs, Iowa. Branch, Saint Joseph to Hopkins	Kansas City, Saint Joseph and Council Bluffs.	203 61.50		12 12	31,495 00		140 00 50 00	
10507	Moberly to Ottumwa, Iowa	North Missouri	125.75		6	12,575 00		100 00	
10508	Tipton to Boonville	Pacific Railroad Co. of Missouri	25		6	1,250 00		50 00	
10509	Centralia to Columbia	North Missouri	22		6	1,100 00		50 00	
10510	Kansas City to Cameron	Hannibal and Saint Joseph	54		6	7,480 00		125 00	$730 per annum included for ferriage.
10512	Sedalia to Denison, Tex	Missouri, Kansas and Texas	447		6	67,050 00		150 00	
10513	Saint Joseph to Lexington	Saint Louis and Saint Joseph	76.75		6	3,837 50		50 00	
10514	Brunswick to Pattonsburgh	Brunswick and Chillicothe and Saint Louis, Council Bluffs and Omaha.	80.05		6	4,002 50		50 00	
10514*a*	Holden to Paola, Kans	Osage Division Missouri, Kansas and Texas.	55		6	2,750 00		50 00	
10515*a*	Hannibal to Moberly	Toledo, Wabash and Western	70.67		6	2,120 10		30 00	
10516*a*	Alexandria to Centreville	Missouri, Iowa and Nebraska	85.63		6	4,281 50		50 00	
10517*a*	Pleasant Hill to Lawrence, Kans	Lawrence Branch Pacific Railroad Company of Missouri.	62		6	3,100 00		50 00	
10518*a*	Sedalia to Lexington	Lexington Branch Pacific Railroad Company of Missouri.	56.25		6	2,812 50		50 00	
10519*a*	Quincy to Keokuk, Iowa	Mississippi Valley and Western	41		6	2,050 00		50 00	
10520*a*	Quincy to Kirksville	Quincy, Missouri and Pacific	71.28		6	3,564 00		50 00	
10521*a*	Pierce City to Centre Creek	Memphis, Carthage and Northwestern.	37.31		6	1,865 50		50 00	
10522*a*	Mexico to Cedar City	Missouri Division (South Branch) Chicago and Alton.	50.62		6	2,531 00		50 00	
10523*a*	Road House, Ill., to Mexico, Mo	Chicago and Alton	90	3,330.31	6	4,500 00	363,234 60	50 00	Pay estimated.

B.—*Railroad service as in operation on the 30th of June*, 1873—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	TENNESSEE.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
10001	Knoxville to Bristol	East Tennessee, Virginia & Georgia	130.7		14	29,407 50		225 00	
10002	Knoxville to Chattanooga	do	112		14	28,050 00		225 00	
	Branch, Cleveland to Dalton, Ga.	do	28½		7			100 00	
10003	Rogersville to Bull's Gap	Rogersville and Jefferson	15		6	790 00		52 66	
10004	Nashville to Chattanooga	Nashville and Chattanooga	114		13	25,220 00		150 00	
	Branch, Wartrace Depot to Shelbyville.		39		20			200 00	
			8		7			40 00	
10005	Fayetteville to Decherd	Southern Railway Security Company.	40		6	1,600 00		40 00	
10006	Nashville to Decatur, Ala	Nashville and Decatur	122⅓		6	9,175 00		75 00	
10007	Nashville to Hickman, Ky	Nashville and Chattanooga	170		6	12,750 00		75 00	
10008	Nashville to Guthrie, Ky	Edgefield and Kentucky	48		7	4,320 00		90 00	
10009	Guthrie, Ky., to Paris, Tenn	Memphis, Clarksville & Louisville.	82½		7	8,250 00		100 00	
10010	Memphis to Paris	Louisville and Nashville	132½		6	19,875 00		150 00	
10011	Knoxville to Coal Creek	Knoxville and Kentucky	31½		6	721 00		22 88	
10012	Morristown to Riverside	Cincinnati, Cumberland Gap and Charleston.	39.8		6	995 00		25 00	
10014	Tracy City to Cowan	Tennessee Coal and Railroad Company.	23		6	690 00		30 00	
10095	Jasper to Bridgeport, Ala	Nashville and Chattanooga	12		6	360 00		30 00	
10123	Nashville to Lebanon	Tennessee and Pacific	32¾		13	1,637 50		50 00	
10137	Tullahoma to McMinnville	McMinnville and Manchester	35		7	1,750 00		50 00	
				1,216.58			145,591 00		
	KENTUCKY.								
9605	Ashland to Coalton	Lexington and Big Sandy	11		6	325 00		29 54	
9606	Covington to Nicholasville	Kentucky Central	99		12	10,550 00		100 00	
9607	La Grange to Lexington		13		6			50 00	
9607*a*	Covington to Louisville	Louisville, Cincinnati & Lexington	67		12	6,700 00		100 00	
9608	Louisville to Nashville, Tenn	do	108¼		12	16,237 50		150 00	
9609	Junction to Bardstown	Louisville and Nashville	186.6		12	32,655 00		175 00	
9610	Lebanon Junction to Fish Point	do	17.3		6	540 00		31 21	
	Branch, Richmond Junction to Richmond.	do	109.9		6	7,185 00		50 00	
		do	33.8		6				
9611	Bowling Green to Guthrie	do	51		13	7,650 00		150 00	

9612	Paducah to Troy Station, Tenn	Paducah and Gulf	62		6	3,100 00		50 00	
9612a	Evansville, Ind., to Guthrie, Ky	Saint Louis and Southeastern	110.66		7	8,299 50		75 00	
9738	Elizabethtown to Paducah	Elizabethtown and Paducah	185		6	15,725 00		85 00	
9742	Glasgow Junction to Glasgow	Louisville and Nashville	12		6	600 00		50 00	
9796a	Anchorage to Shelbyville	Shelby	19		6	950 00		50 00	
9824	Grayson to Greenup Court-House	Eastern Kentucky	23¾		6	500 00		21 05	
9842	Owensborough to Owensborough Junction.	Owensborough and Russellvllle	36.13		6	1,083 90		30 00	
9843	Maysville to Paris	Maysville and Lexington	50		12	2,500 00		50 00	
9846a	Lexington to Mount Sterling	Louisville, Cincinnati and Lexington.	33.84		6	1,692 00		50 00	
				1,229.23			116,292 90		
	OHIO.								
9001	Bellaire to Columbus	Central Ohio	137⅞		14	24,128 12		175 00	
9002	Pittsburgh, Pa., to Chicago, Ill	Pittsburgh, Fort Wayne & Chicago	469½		12	140,850 00		300 00	
9003	Rochester to Bellaire	Cleveland and Pittsburgh	68¾		18	8,593 75		125 00	
9004	Erie, Pa., to Cleveland, Ohio	Lake Shore and Michigan Southern	96		13	36,000 00		375 00	
9005	Hudson to Mount Vernon	Cleveland, Mount Vernon and Delaware.	100.68		6	5,537 40		55 00	
9006	Cleveland to Sharon	Atlantic and Great Western	49.75 31.61		12 12	6,871 60		100 00 60 00	
9007	Cleveland to Wellsville	Cleveland and Pittsburgh	45.86 56.50		18 12	15,354 00		150 00 150 00	
9008	Elyria to Millbury	Lake Shore & Michigan Southern	74.98		6	3,749 00		50 00	Pay estimated.
9009	Bayard to New Philadelphia	Cleveland and Pittsburgh	32½		6	1,625 00		50 00	
9010	Oneida Mills to Carrollton	Carrollton and Oneida	12		6	500 00		41 66	
9011	Sandusky to Newark	Baltimore and Ohio, lessees of Sandusky, Mansfield and Newark.	116		6	11,600 00		100 00	
9012	Xenia to Dayton	Pittsburgh, Cincinnati and Saint Louis.	17		12	1,445 00		85 00	
9013	Springfield to Sandusky	Cincinnati, Sandusky & Cleveland	131.35		12	6,567 50		50 00	Do.
9015	Columbus to Delaware	Cleveland, Columbus, Cincinnati and Indianapolis.	24¼		24	3,093 75		125 00	
9016	Columbus to Xenia	Columbus and Xenia	55		6	17,875 00		325 00	
9017	Columbus to Indianapolis, Ind	Columbus, Chicago and Indiana Central.	188		12	37,600 00		200 00	
9018	Galion to Indianapolis, Ind	Cleveland, Columbus, Cincinnati and Indianapolis.	204		12	40,800 00		200 00	
9019	Blanchester to Hillsborough	Marietta and Cincinnati	21		6	1,050 00		50 00	
9020	Portsmouth to Reed's Mills	do	56		6	5,600 00		100 00	
9021	Toledo to Cleveland	Lake Shore & Michigan Southern	114		12	42,750 00		375 00	
9022	Toledo to Quincy, Ill Branch, Bluff City, Ill., to Naples Branch, Clayton, Ill., to Keokuk, Iowa.	Toledo, Wabash and Western	476 4 44		12 6 6	110,620 00		225 00 55 00 75 00	
9024	Fremont to Lima	Lake Erie and Louisville	68.85		6	3,442 50		50 00	
9025	Carey to Findley	Cincinnati, Sandusky and Cleveland.	16		12	800 00		50 00	Do.
9026	Dayton to Union City	Dayton and Union	48.17		6	2,890 20		60 00	
9027	Dayton to Toledo	Dayton and Michigan	71.43 71.53		18 12	17,870 00		125 00 125 00	

B.—*Railroad service as in operation on the 30th of June*, 1873—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	OHIO—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
9028	Hamilton to Indianapolis	Cincinnati and Indianapolis Junction.	99.49		12	4,974 50		50 00	
9029	Hamilton to Richmond	Cincinnati, Richmond and Chicago.	45.1		6	4,961 00		110 00	
9030	Cincinnati to Dayton	Cincinnati, Hamilton and Dayton.	26.53 33.92		43 31	9,730 75		175 00 150 00	
9031	Cincinnati to Springfield	Little Miami	65.96		13	4,248 00		50 00	
9032	Cincinnati to Parkersburgh, W. Va.	Marietta and Cincinnati	19 206		6 6	36,050 00		50 00 175 00	Pay estimated.
9033	Morrow to Dresden	Cincinnati and Muskingum Valley	149.4		6	11,205 00		75 00	
9034	Dayton to Richmond	Pittsburgh, Cincinnati and Saint Louis.	42		7	2,730 00		65 00	
9035	Valley Junction to Hagerstown, Ind	White Water Valley	70.45		6	3,874 75		55 00	
9036	Columbus to Pittsburgh, Pa. Branch, Means to Cadiz	Pittsburgh, Cincinnati and Saint Louis.	160 8		14 14	44,400 00		275 00 50 00	
9037	Springfield to Columbus	Cincinnati, Sandusky and Cleveland.	45.86		6	2,293 00		50 00	Do.
9038	Salamanca, N. Y., to Dayton, Ohio	Atlantic and Great Western	61 328.55		13 13	32,994 00		110 00 80 00	
9039	Youngstown to Cross-Cut	Pittsburgh, Fort Wayne and Chicago.	22.8		6	1,140 00		50 00	Do.
9040	Columbus to Athens Branch, Logan to New Straitsville.	Columbus and Hocking Valley	77.04 13.02		12 12	6,325 80		75 00 40 00	
9041	Niles to New Lisbon	Niles and New Lisbon	33.94		6	1,697 00		50 00	
9042	Newark to Shawnee	Newark, Somerset and Straitsville.	44.45		12	1,761 80		40 00	
9043	Clinton to Massillon	Cleveland, Mount Vernon and Delaware.	13.7		6	548 00		40 00	
9044	Marietta to Cambridge	Marietta and Pittsburgh	60.11		6	2,404 40		40 00	
9045	Black River to Uricksville	Lake Shore and Tuscarawas Valley.	102.45		6	5,122 50		50 00	Do.
9046	Cleveland to Cincinnati	Cleveland, Columbus, Cincinnati and Indianapolis Junction.	245.25		12	55,181 25		225 00	
				4,877.06			778,854 57		
	INDIANA.								
12001	Indianapolis to Vincennes	Indianapolis and Vincennes	116.32		6	5,816 00		50 00	

12002	Indianapolis to Terre Haute	Terre Haute and Indianapolis	73		21	14,600 00		200 00	
12003	Indianapolis to Cincinnati, Ohio	Indianapolis, Cincinnati and La Fayette.	113.5		18	17,025 00		150 00	
12004	Indianapolis to Peru	Indianapolis, Peru and Chicago	55 24		18 6	10,500 00		150 00 75 00	$600 per annum included for side-service.
12005	Indianapolis to La Fayette	Indianapolis, Cincinnati and La Fayette.	65.625		18	9,843 75		150 00	
12006	Columbus to Madison	Jeffersonville, Madison and Indianapolis.	46		6	2,300 00		50 00	
12007	New Albany to Indianapolis	do	114		18	17,100 00		150 00	
12008	New Albany to Michigan City	Louisville, New Albany and Chicago.	61 227		12 6	14,400 00		50 00 50 00	Pay estimated.
12009	Richmond to Chicago, Ill	Pittsburgh, Cincinnati and Saint Louis.	225.5		12	33,825 00		150 00	
12010	Cincinnati, Ohio, to East Saint Louis, Ill.	Ohio and Mississippi	341		19	68,200 00		200 00	
12011	Cambridge City to Columbus	Jeffersonville, Madison and Indianapolis.	68		6	2,720 00		40 00	
12012	Evansville to Rockville	Evansville and Crawfordsville	110 23		12 12	10,500 00		85 00 50 00	
12013	State Line to Logansport	Pittsburgh, Cincinnati and Saint Louis.	61		6	3,050 00		50 00	
12014	Peru to La Porte	Chicago, Cincinnati and Louisville.	73		6	3,650 00		50 00	
12015	Fairland to Martinsville	Cincinnati and Martinsville	38.5		6	1,732 50		45 00	
12016	Bradford, Ohio, to Logansport, Ind.	Pittsburgh, Cincinnati and Saint Louis.	114.6		6	5,730 00		50 00	
12017	Indianapolis to Peoria, Ill	Indianapolis, Bloomington and Western.	212.2		6	19,098 00		90 00	
12018	Jeffersonville to North Vernon	Ohio and Mississippi	53.5		6	5,350 00		100 00	
12019	Fort Wayne to Connersville	Fort Wayne, Muncie and Cincinnati.	109		6	5,450 00		50 00	
12020	Richmond to Fort Wayne	Cincinnati, Richmond and Fort Wayne.	91.5		6	3,660 00		40 00	
12021	Wabash to Goshen	Cincinnati, Wabash and Michigan	61		6	3,050 00		50 00	
12022	Princeton to Mount Carmel	Louisville, New Albany and Saint Louis Air-Line.	10.85		6	325 50		30 00	
12023	Terre Haute to Danville	Evansville, Terre Haute and Chicago.	56.60		6	2,830 00		50 00	
12024	Indianapolis to Terre Haute	Indianapolis and Saint Louis	72		6	8,280 00		115 00	
12025	La Porte to Michigan City	Indianapolis, Peru and Chicago	12.36		6	618 00		50 00	
12026	Auburn to Logansport	Detroit, Eel River and Illinois	82.8		6	4,140 00		50 00	Do.
12027	Rockville to Logansport	Logansport, Crawfordsville and Southwestern.	92.1		6	3,684 00		40 00	
12028	La Fayette to Kankakee, Ill	Cincinnati, La Fayette and Chicago	57.35		6	8,062 50		150	
12029	Terre Haute to Martz	Cincinnati and Terre Haute	26.15		6	1,307 50		50	Do.
12030	Attica to Veedersburgh	Indiana North and South	14		6	700 00		50	Do.
				2,900.46			287,547 75		
	ILLINOIS.								
11401	Chicago to Milwaukee, Wis	Chicago and Northwestern	87		18	15,225 00		175 00	

B.—*Railroad service as in operation on the 30th of June*, 1873—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	ILLINOIS—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
11402	Chicago to Freeport	Chicago and Northwestern	92.50 28.50		18 12	18,150 00		150 00 150 00	
11403	Chicago to Council Bluffs, Iowa	do	98		24	9,800 00		200 00	
11404	Chicago to Davenport, Iowa	Chicago, Rock Island and Pacific	392 183		18 12	36,600 00		200 00 200 00	
11405	Chicago to Burlington, Iowa Branch to Galena Junction Branch to Keithsburgh	Chicago, Burlington and Quincy	207.70 13 59.03		18 6 6	75,347 50		225 00 50 00 50 00	Includes $25,000 for Sunday service.
11406	Chicago to East Saint Louis	Chicago and Alton	283		12	56,600 00		200 00	
11407	Chicago to Cairo	Illinois Central	253 112		12 12	42,100 00		100 00 150 00	
11408	Elgin to Geneva	Chicago and Northwestern	44		6	2,200 00		50 00	
11409	Rushville to Yates City Branch, Elmwood to Buda	Chicago, Burlington and Quincy	63.75 44.50		6 6	5,412 50		50 00 50 00	
11410	Courtland Station to Sycamore	Sycamore and Courtland	5		12	400 00		50 00	$150 per annum included for mail-messenger service.
11411	State Line, Ind., to Warsaw, Ill	Toledo, Peoria and Warsaw	111 117.75		6 6	14,880 00		65 00 60 00	$600 per annum included for ferriage.
11412	Bureau Junction to Peoria	Chicago, Rock Island and Pacific	47		6	3,525 00		75 00	
11413	Joliet to Lake Station, Ind	Michigan Central	45		6	1,125 00		25 00	
11414	Peoria to Jacksonville	Peoria, Pekin and Jacksonville	87.40		6	4,370 00		50 00	
11415	Peoria to Galesburgh	Chicago, Burlington and Quincy	48 6		6 12	3,510 00		65 00 65 00	
11416	Bloomington to Godfrey	Chicago and Alton	152		12	15,200 00		100 00	
11417	Galesburgh to Quincy	Chicago, Burlington and Quincy	100		18	16,000 00		160 00	
11418	Dubuque, Iowa, to Centralia, Ill	Illinois Central	344		12	34,400 00		100 00	
11419	Terre Haute, Ind., to East Saint Louis, Ill.	Indianapolis and Saint Louis	189		12	40,635 00		215 00	
11421	Carbondale to Grand Tower	Grand Tower Mining, Manufacturing and Transportation Company.	25		6	1,000 00		40 00	
11422	East Saint Louis to Du Quoin	St. Louis, Alton and Terre Haute.	71.80		12	7,180 00		100 00	
11424	Washington to Dwight Branch, Varna to Lacon	Chicago and Alton	60.21 10.60		12 12	3,540 50		50 00 50 00	
11425	East Saint Louis to Terre Haute, Ind.	Terre Haute and Indianapolis, lessees.	165.40		12	28,945 00		175 00	
11426	Decatur to Saint Louis	Toledo, Wabash and Western	112		12	16,800 00		150 00	
11427	Pekin to Decatur	do	68.46		6	2,738 40		40 00	
11428	Peoria to Rock Island	Peoria and Rock Island	92		12	4,600 00		50 00	

11429	Sterling to Alton Junction	Rockford, Rock Island and Saint Louis.	70		12	24,372 00		90 00		
11430	Sagetown to Keithsburgh	do	100.80		18			90 00		
11431	Quincy to Louisiana, Mo	Quincy, Alton and Saint Louis	18		6	540 00		30 00		
11432	Burlington, Iowa, to Quincy, Ill	Chicago, Burlington and Quincy	43		6	3,440 00		80 00		
11433	Beardstown to Shawneetown	Springfield and Illinois Southeastern.	71.85		6	3,592 50		50 00		
11434	Chicago to Danville	Chicago, Danville and Vincennes	229.70		6	17,227 50		75 00		
11900	Saint Louis Mo., to Evansville, Ind. Branch, McLeansborough to Shawneetown.	Saint Louis and Southeastern	127		6	3,240 00		30 00		Paid for 108 miles.
			164.75		6	16,477 50		90 00		
			41.25		6			40 00		
11901	Streator to Aurora	Chicago, Burlintgon and Quincy, lessees.	60.79		6	3,489 50		50 00		
	Branch, Aurora to Batavia		9		6			50 00		
11902	Mendota to Clinton	do	64.19		6	2,567 60		40 00		
11903	Hannibal, Mo., to Naples, Ill Branch, Maysville to Pittsfield.	Toledo, Wabash and Western	51.50		6	2,575 00		50 00		
11905	Streator to Fairbury	Fairbury, Pontiac and Northwestern.	32.38		6	971 40		30 00		
11906	Mattoon to Hervey City	Chicago and Illinois Southern, (consolidated.)	31.66		6	1,266 40		40 00		
11907	Springfield to Gilman	Gilman, Clinton and Springfield	111.60		6	5,580 00		50 00		
11908	Carbondale to Marion	Carbondale and Shawneetown	18		6	720 00		40 00		
11909	Jacksonville to Virden	Jacksonville, Northwestern and Southeastern.	31.39		6	1,569 50		50 00		
11910	Urbana to Havana Branch, White Heath to Monticello.	Indianapolis, Bloomington and Western.	102.70		6	5,427 50		50 00		Pay estimated.
			5.85		6			50 00		
11911	Chester to Tamaroa	Chester and Tamaroa Coal and Railroad Company.	41.93		6	1,680 00		40 00		
11913	Aurora to Foreston	Chicago and Iowa	81.64		6	3,265 60		40 00		
11914	Paris to Decatur	Paris and Decatur	76.03		6	3,041 20		40 00		
11915	Petersburgh to Havana	Springfield and Northwestern	25.50		6	1,020 00		40 00		
11916	La Fayette, Ind., to Bloomington, Ill.	Toledo, Wabash and Western	116.43		6	5,821 50		50 00		
11917	Vincennes, Ind., to Cairo, Ill	Cairo and Vincennes	160		6	8,000 00		50 00		Do.
11918	Paris to Danville	Paris and Danville	36		6	1,080 00		30 00		
11919	Rock Falls to Shabbona	Chicago, Burlington and Quincy	47.23		6	1,889 20		40 00		
11920	Streator to Pekin	Chicago, Pekin and Southwestern	65.28		6	3,264 00		50 00		
11921	Chicago to Milwaukee, Wis	Chicago, Milwaukee and Saint Paul	88.25		6	13,237 50		150 00		Do.
				6,042.30			683,839 30			
	MICHIGAN.									
12501	Toledo, Ohio, to Chicago, Ill	Lake Shore and Michigan Southern.	244.85		12	91,818 75		375 00		
12501½	Toledo, Ohio, to Elkhart, Ind	do	133.6		6	10,200 00		76 35		
12502	Toledo, Ohio, to Detroit, Mich	do	64.75		6	6,475 00		100 00		
12503	Monroe to Adrian	do	35		6	2,675 00		75 00		
12504	Adrian to Jackson	do	47.2		6	2,360 00		50 00		
12505	White Pigeon to Kalamazoo	do	38⅓		6	1,966 66		50 00		
12506	Detroit to Chicago, Ill	Michigan Central	209.25		24	49,918 75		175 00		
			76		30			175 00		
12507	Detroit to Grand Haven	Detroit and Milwaukee	190		12	19,000 00		100 00		

B.—*Railroad service as in operation on the 30th of June*, 1873—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	MICHIGAN—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
12508	Detroit to Port Huron	Grand Trunk Railway of Canada	64.25		6	6,425 00		100 00	
12509	Jackson to Fort Wayne, Ind	Fort Wayne, Jackson and Saginaw	96.30		6	4,815 00		50 00	
12510	Jackson to Roscommon	Michigan Central, (lessees of Jackson, Lansing and Saginaw.)	190.80		6	9,540 00		50 00	
12511	Jackson to Grand Rapids	Michigan Central	94.50		6	4,725 00		50 00	
12512	Kalamazoo to Grand Rapids	Lake Shore and Michigan Southern	58.875		6	3,532 50		60 00	
12513	Ridgeway to Romeo	Saint Clair and Chicago Air-Line, (lessees of Michigan Air-Line.)	14.6		6	730 00		50 00	
12515	Bay City to Monroe	Flint and Pere Marquette	132		12	9,900 00		75 00	
12516	East Saginaw to Reed City	do	90.47		6	4,552 50		50 00	
12517	Detroit to Howard City	Detroit, Lansing and Lake Michigan.	164		6	12,300 00		75 00	
12518	Fort Wayne, Ind., to Walton, Mich.	Grand Rapids and Indiana	260.1		6	13,005 00		50 00	
12519	Kalamazoo to South Haven	Michigan Central	39.81		6	1,990 50		50 00	
12520	Lansing to South Bend	Peninsular	122.72		12	6,136 00		50 00	
12521	New Buffalo to Pentwater	Chicago and Michigan Lake Shore	165.5		12	9,545 00		50 00	
	Branch, Holland to Grand Rapids		25.4		12			50 00	
12522	Port Huron to Flint	Port Huron and Lake Michigan	68		6	3,400 00		50 00	
12523	Monteith to Muskegon	Michigan Lake Shore	68.75		6	3,437 50		50 00	
12525	Ypsilanti to Banker's	Detroit, Hillsdale and Indiana	65.40		6	2,616 00		40 00	
12526	Jackson to Niles	Michigan Central	103		6	5,150 00		50 00	
12527	Grand Rapids to Newaygo	Grand Rapids, Newaygo and Lake Shore.	36.40		6	1,092 00		30 00	
12528	Niles to South Bend	Michigan Central, (South Bend Division.)	12.20		6	610 00		50 00	
12529	Jonesville to Lansing	Lake Shore and Michigan Southern	60.87		6	3,043 50		50 00	
12529*a*	Detroit to Lapeer	Detroit and Bay City	61.19		6	3,059 50		50 00	Pay estimated.
12846	Esconawba to Negaunee	Chicago and Northwestern	62.22		6	4,666 50		75 00	
12847	Negaunee to Marquette	Marquette and Ontonagon	14		6	1,050 00		75 00	May 1 to November 15, in each year.
12849	Negaunee to Champion	do	18		6	900 00		50 00	
12948	Flint to Otter Lake	Flint and Pere Marquette	19½		6	956 25		50 00	Pay estimated.
12949	East Saginaw to Saint Louis	Saginaw Valley and Saint Louis	35.28		6	1,764 00		50 00	Do.
12950	Fort Howard to Esconawba	Chicago and Northwestern	114.6		6	5,730 00		50 00	Do.
				3,297.343			309,005 91		

	WISCONSIN.								
13001	Chicago, Ill., to Green Bay, Wis....	Chicago and Northwestern.....	{ 63 { 182	.....	18 12	42,875 00	.....	{ 175 00 { 175 00	
13002	Kenosha to Rockford, Ill	.....do	73.6	.....	6	4,416 00	.....	60 00	
13003	Racine to Rock Island Junction, Ill.	Western Union	189.4	.....	12	9,470 00	.....	50 00	
13004	Milwaukee to North McGregor, Iowa.	Milwaukee and Saint Paul.....	197.2	.....	12	29,580 00	.....	150 00	
13005	Milwaukee to La Crosse.....	.....do	198	.....	12	29,700 00	.....	150 00	
13006	Milwaukee to Berlin	.....do	94.8	.....	6	7,110 00	.....	75 00	
13007	Milton Junction to Monroe.....	.....do	42.8	.....	6	2,140 00	.....	50 00	
13008	Watertown to Madison.....	.....do	38.45	.....	12	3,845 00	.....	100 00	
13009	Horicon to Portage City.....	.....do	45¼	.....	6	3,393 00	.....	75 00	
13010	Nepeuskun to Winneconne.....	.....do	16¼	.....	6	650 00	.....	40 00	
13011	Warren to Mineral Point.....	Mineral Point.....	33	.....	6	1,650 00	.....	50 00	
13012	Sheboygan to Princeton	Sheboygan and Fond du Lac.....	79½	.....	12	4,830 00	.....	60 00	$60 per annum included for mail-messenger service.
13013	Caledonia Station, Ill., to Elroy, Wis.	Chicago and Northwestern.....	135.45	.....	6	13,545 00	.....	100 00	
13014	Tomah to Saint Paul, Minn.....	West Wisconsin	180.2	.....	6	9,010 00	.....	50 00	
13015	Calamine to Platteville.....	Mineral Point.....	18.7	.....	6	935 00	.....	50 00	
13016	Madison to Portage City	Madison and Portage	39½	.....	6	1,975 00	.....	50 00	
13017	Winona, Minn., to Winona Junction, Wis.	Chicago and Northwestern.....	28	.....	6	1,400 00	.....	50 00	
13018	Menasha and Neenah to Stevens Point.	Phillips and Colby, operating Wisconsin Central.	65.27	.....	6	3,263 50	.....	50 00	
13394	Oshkosh to Ripon	Milwaukee and Saint Paul.....	21	.....	6	1,050 00	.....	50 00	
13395	Green Bay to Merrilan.....	Green Bay and Lake Pepin	150.51	.....	6	7,525 50	.....	50 00	
13396	Milwaukee to Menasha.....	Milwaukee and Northern	100	.....	12	5,000 00	.....	50 00	
				1,991.88			183,363 00		
	IOWA.								
11001	Keokuk to Fort Dodge	Des Moines Valley.....	249.7	.....	12	18,727 50	.....	75 00	
11002	Keokuk to Burlington.....	Chicago, Burlington and Quincy ..	42.75	.....	6	3,420 00	.....	80 00	
11003	{ Burlington to East Plattsmouth.. { Branch, Red Oak to Eastport.....	{ Burlington and Missouri River...	{ 279.14 { 50	.....	12 12	51,349 50	.....	{ 175 00 { 50 00	
11004	Wilton Junction to Leavenworth, Kans.	Chicago, Rock Island and Pacific..	322.77	.....	6	19,366 20	.....	60 00	
11005	Davenport to Missouri River.....	.....do	318	.....	6	47,700 00	.....	150 00	
11006	Farley to Cedar Rapids.....	Dubuque and Southwestern.....	55.37	.....	6	3,322 20	.....	60 00	
11007	Dubuque to Sioux City.....	Illinois Central	327.12	.....	12	32,712 00	.....	100 00	
11008	Albia to Northwood.....	Central Railroad Company of Iowa	189.2	.....	6	9,460 00	.....	50 00	
11009	Calmar to Algona	Milwaukee and Saint Paul.....	127.8	.....	6	6,390 00	.....	50 00	
11010	Waterloo to Mona.....	Illinois Central	80	.....	6	4,000 00	.....	50 00	
11011	Missouri Valley to Wisner, Nebr ..	Sioux City and Pacific	{ 76 { 83.4	.....	6 6	9,870 00	.....	{ 75 00 { 50 00	
11012	Burlington to Plymouth.....	Burlington, Cedar Rapids and Minnesota.	228	.....	6	12,540 00	.....	55 00	
11013	Davenport to Delaware Centre	Davenport and Saint Paul	90.3	.....	6	4,501 50	.....	50 00	
11014	Davenport to Maquoketa.....	.....do	42.76	.....	6	1,454 00	.....	34 00	
11015	Clinton to Anamosa	Iowa Midland.....	74.1	.....	6	2,223 00	.....	30 00	

B.—*Railroad service as in operation on the 30th of June*, 1873—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	IOWA—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
11016	Clinton to La Crescent, Minn	Chicago, Dubuque and Minnesota	178.57		6	8,928 50		50 00	Pay estimated.
11017	Sabula to Marion	Sabula, Ackley and Dakota	87.75		6	3,510 00		40 00	
11018	Creston to Hopkins, Mo	Burlington and Missouri River	44.4		6	2,220 00		50 00	
11019	Viele Junction to Cincinnati	Burlington and Southwestern	89.5		6	2,685 00		30 00	
11003, 3d p't	Chariton to Leon	Burlington and Missouri River	37.44		6	1,872 00		50 00	
11003, 4th p't	Villisca to Clarinda	do	16		6	640 00		40 00	
11005*a*	Des Moines to Indianola	Chicago, Rock Island and Pacific	21.4		6	2,425 00		50 00	Do.
	Branch, to Winterset	do	27.1		6			50 00	
11005*b*	Washington to Sigourney	do	29		6	1,450 00		50 00	Do.
11012*a*	Muscatine to Lone Tree	Burlington, Cedar Rapids and Minnesota.	23.23		6	696 90		30 00	
11012*b*	Cedar Rapids to Centre Point	do	19.5		6	585 00		30 00	
11012*c*	West Union to Postville	do	24.4		6	976 00		40 00	
11016*a*	Conover to Decorah	Milwaukee and Saint Paul	9.5		12	522 50		55 00	
11017*b*	Stanwood to Tipton	Chicago and Northwestern	8.81		6	440 50		50 00	Do.
11020*a*	Beulah to Elkader	Iowa Eastern	17.75		6	887 50		50 00	Do.
				3,270.78			254,874 80		
	MINNESOTA.								
13501	La Crosse, Wis., to Winnebago City, Minn.	Southern Minnesota	170.5		6	10,230 00		60 00	
13503	Winona to Saint Peter	Winona and Saint Peter	145.60		6	12,376 00		85 00	
	Branch to Mankato								
13504	Minneapolis to North McGregor, Iowa.	Milwaukee and Saint Paul	215.7		12	32,355 00		150 00	
13505	Saint Paul to Sioux City, Iowa	Saint Paul and Sioux City	179		12	12,250 00		50 00	26 miles covered by another route.
			92		6			50 00	
13506	Saint Paul to Breckinridge	Saint Paul and Pacific	219.25		12	10,962 50		50 00	
13507	Saint Paul to Sauk Rapids	do	78		12	5,850 00		75 00	
13508	Saint Paul to Du Luth	Lake Superior and Mississippi	156		6	7,800 00		50 00	
13510	Minnesota City to Weaver	Chicago and Northwestern	14		6	560 00		40 00	
13511	Austin to Mason City	Milwaukee and Saint Paul	41.38		6	1,655 20		40 00	
13512	Saint Paul to Stillwater	Lake Superior and Mississippi	24.95		6	660 00		50 00	For 13.20 miles.
13513	Saint Paul to Winona	Saint Paul and Chicago	114.01		6	5,700 50		50 00	Pay estimated.

13514	Hastings to Glencoe	Milwaukee and Saint Paul	74.59		6	3,729 50		50 00	
13837	White Bear Lake to Sioux City Junction.	Lake Superior and Mississippi	41		6	2,050 00		50 00	
13838	Du Luth to Moorehead	Northern Pacific	252		6	11,450 00		50 00	For 229 miles.
13839	Saint Peter to New Ulm	Chicago and Northwestern	30.65		6	919 50		30 00	Pay estimated.
				1,848.63			118,548 20		
	NEBRASKA.								
14401	Omaha to Ogden City, Utah	Union Pacific	1,032.2		7	283,855 00		275 00	
14451	Plattsmouth to Kearney Junction	Burlington and Missouri River	191		6	9,550 00		50 00	
14478	Omaha to Blair	Omaha and Northwestern	30		6	1,500 00		50 00	
14479	Omaha to Concord	Burlington and Missouri River Railroad in Nebraska.	21.5		6	1,338 00		50 00	$313 per annum included for ferriage.
14483	Nebraska City to Seward	Midland Pacific	84.1		6	4,205 00		50 00	
14497	Crete to Beatrice	Burlington and Missouri River	31.76		6	1,588 00		50 00	
				1,390.56			302,036 00		
	KANSAS.								
14001	Kansas City, Mo., to Cheyenne, Wyo. Branch, Leavenworth to Lawrence.	Kansas Pacific	745 33		7 7	114,555 00		150 00 85 00	
14002	Atchison to Waterville	Central Branch Union Pacific	100		7	7,500 00		75 00	
14003	Lawrence to Parker Branch, Cherryvale to Independence.	Leavenworth, Lawrence and Galveston.	143.5 10		12 6	14,850 00		100 00 50 00	
14004	Elwood to Hastings, Nebr	Saint Joseph and Denver City	227.2		6	12,496 00		55 00	
14005	Kansas City, Mo., to Baxter Springs.	Missouri River, Fort Scott and Gulf.	164		6	16,400 00		100 00	
14006	Junction City to Parsons	Missouri, Kansas and Texas	156.5		6	9,390 00		60 00	
14143	Atchison to Sargent Branch, Newton to Wichita	Atchison, Topeka and Santa Fé	351.25 119 26		6 6 6	43,675 00		100 00 50 00 100 00	
14211	Olathe to Ottawa	Leavenworth, Lawrence and Galveston.	32		6	3,200 00		100 00	
14212	Atchison to Lincoln, Nebr	Atchison and Nebraska	152.28		6	9,136 80		60 00	
14235	Leavenworth to Holton	Kansas Central	55.62		6	2,781 00		50 00	Pay estimated,
14311	Lawrence to Carbondale	Lawrence and Southwestern	32.9		6	1,645 00		50 00	Do.
14314	Junction City to Clay Centre	Junction and Fort Kearney	33.85		6	1,692 50		50 00	Do.
				2,382.10			237,321 50		
	NEVADA.								
16419	Virginia City to Reno	Virginia and Truckee	51.75		6	3,741 00		72 29	
				51.75			3,741 00		
	CALIFORNIA.								
14701	San Francisco to Ogden City, Utah	Central Pacific	877.5		7	241,312 50		275 00	
14702	San Francisco to Salinas Branch, Gilroy to Hollister	Southern Pacific	118 14		13 13	13,200 00		100 00 100 00	

B.—*Railroad service as in operation on the 30th of June*, 1873—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	CALIFORNIA—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
14703	Roseville to Tehama	Central Pacific, (Oregon division)	105		7	7,875 00		75 00	
14704	Folsom City to Shingle Springs	Placerville and Sacramento Valley	26		6	1,300 00		50 00	
14705	Sacramento City to Folsom City	Sacramento Valley	23.2		6	1,160 00		50 00	
14707	Sacramento City to San Francisco	California Pacific	83		14	12,450 00		150 00	
	Branch, Davisville to Marysville		42		6	3,150 00		75 00	
14708	Napa Junction to Calistoga	do	36		6	1,800 00		50 00	
14709	Marysville to Oroville	California Northern	30		6	1,500 00		50 00	
14728	Wilmington to Los Angeles	Los Angeles and San Pedro	22		6	1,650 00		75 00	
14876	Lathrop to Goshen	Central Pacific	144.91		6	7,245 50		50 00	
14877	Elmira to Vacaville	Vaca Valley	4		6	200 00		50 00	
14880	San Francisco to Cloverdale	San Francisco and North Pacific	56		6	2,800 00		50 00	
14881	Stockton to Milton	Stockton and Copperopolis	30		6	2,450 00		50 00	
	Branch, Peters to Oakdale		19		6			50 00	
				1,630.61			298,093 00		
	DAKOTA.								
13929	Sioux City, Iowa, to Yankton, Dak.	Dakota Southern	61.48		6	4,611 00		75 00	
				61.48			4,611 00		
	UTAH.								
16633	Salt Lake City to Ogden City	Utah Central	36½		6	1,825 00		50 00	
				36½			1,825 00		
	COLORADO.								
17038	Denver to Black Hawk	Colorado Central	38½		6	3,875 60		50 00	
	Branch, Golden Junction to Longmont		39		6			50 00	
17051	Hughes's Station to Erie	Denver and Boulder Valley	15		6	750 00		50 00	
17064	Denver to Pueblo	Denver and Rio Grande	119		6	5,950 00		50 00	
				211½			10,575 00		

JOHN L. ROUTT,
Second Assistant Postmaster-General.

C.—*Steamboat service as in operation on the 30th of June, 1873.*

Number of route.	State and termini.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Remarks.
	NEW HAMPSHIRE.	*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	
317	Alton Bay to Woltborough	10		6	1,200 00		During navigation.
	Centre Harbor to Meredith Village	20		3			
321	Meredith Village to South Tamworth	16½		6	744 12		Six times a week during navigation; three times a week residue of year.
	Branch, Moultonborough to North Sandwich	8½					
322	Weir's Bridge to Woltborough	30		6			
			85			2,594 12	
	MASSACHUSETTS.						
668	Hyannis to Nantucket	30		6	2,500 00		
			30			2,500 00	
	RHODE ISLAND.						
810	Newport to New York	160		6	2,500 00		
			160			2,500 00	
	NEW YORK.						
1040	Ithaca to Aurora	28		6	1,050 00		
1142	Whitehall to Rouse's Point	120		11	6,000 00		
1465	Geneva to Watkins	47		6	899 00		
1578	Lake George to Fort Ticonderoga	40		6	500 00		
			235			8,449 00	
	NEW JERSEY.						
2105	South Amboy to New York	27		12	2,338 00		Old rate of pay.
2126	New York to Sandy Hook	19½		12	975 00		
2141	New York to Keyport	25		6	522 00		
			71½			3,835 00	
	PENNSYLVANIA.						
2501	Pittsburgh to Greensborough	88½			6,011 25		Six times a week during navigation; three times a week residue of year.
			88½			6,011 25	

C.—*Steamboat service as in operation on the 30th of June*, 1873—Continued.

Number of route.	State and termini.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Remarks.
	MARYLAND.	*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	
3521	Baltimore to Queenstown	40	40	6	750 00	750 00	
	WEST VIRGINIA.						
4104	Wheeling to Parkersburgh	99		6	7,200 00		
4122	Parkersburgh to Gallipolis, Ohio	86			5,639 17		Three times a week, 4 months; six times a week, 8 months.
4136	Kanawha C. H. to Gallipolis, Ohio	65		3	1,724 50		
			250			14,563 67	
	VIRGINIA.						
4401	Washington, D. C., to Game Point, Va	55½		13	11,100 00		
4417	Norfolk to Baltimore, Md	200		6	18,000 00		
4418	Norfolk to Eastville	57		3	3,500 00		
4419	Norfolk to Matthews C. H	60		2	2,000 00		
4420	Norfolk to Richmond	151		3	4,500 00		
4702	Washington, D. C., to Norfolk, Va	200		2	9,000 00		
4755	Fredericksburgh to Baltimore, Md	250		2	2,600 00		Ten months in the year.
			973½			50,700 00	
	NORTH CAROLINA.						
5025	Wilmington to Fayetteville	120		2	1,745 00		
5027	Wilmington to Smithville	30		3	824 25		
5037	Plymouth to Franklin Depot, Va	106		3	4,000 00		
5237	Ocracocke to Hatteras	20		1	290 00		
			276			6,859 25	
	SOUTH CAROLINA.						
5699	Beaufort to Hilton Head	16		1	260 00		
5714	Charleston to Edisto Island	35		2	1,200 00		
			51			1,460 00	

	GEORGIA.						
6119	Trader's Hill to Fernandina, Fla	69		1	1,294 00		
6189	Rome to Gadsden, Ala	155		2	3,600 00		
			224			4,894 00	
	FLORIDA.						
6411	Baltimore, Md., to New Orleans, La	1,700			31,200 00		Twice a month.
6412	New Troy to Cedar Keys	203		1	2,500 00		
6413	New Orleans, La., to Key West, Fla	888		1	76,000 00		
6414	Bainbridge, Ga., to Apalachicola, Fla	202		2	11,500 00		
6419	Cedar Keys to Tampa	225		1	7,448 00		
6420	Pilatka to Jacksonville	83		6	5,700 00		
6421	Pilatka to Mellonville	141		2	3,500 00		
			3,442			137,848 00	
	MISSISSIPPI.						
7023	Vicksburgh to Leigh's	237		1	2,000 00		
7024	Vicksburgh to Greenwood	260		2	7,500 00		
			497			9,500 00	
	LOUISIANA.						
8006	Vicksburgh, Miss., to New Orleans, La	408		3	29,980 00		
8007	Brashear to New Iberia	70		6	12,500 00		
8010	New Orleans to Buras	72		2	4,470 00		
8011	New Orleans to Covington	48		3	4,500 00		
8014	New Orleans to Saint Francisville	170		2	18,000 00		
8103	New Orleans to Grand Isle	96			2,300 00		Twice a week, 4 months; once a week, 8 months.
8114	Lake Charles to Leesburgh	50		2	4,880 00		
8117	New Orleans to Red River Landing	210		3	5,775 00		
			1,124			82,405 00	
	TEXAS.						
8507	Galveston to Brashear, La	220			50,000 00		Three times a week, 6 months; six times a week, 6 months.
8508	Galveston to Indianola	130			10,000 00		Twice a week, 4 months; three times a week, 8 months.
8510	Galveston to Liberty	98		2	8,000 00		
8685	Orange to Wiess Bluff	150		2	10,000 00		
			598			78,000 00	
	ARKANSAS.						
7504	Memphis, Tenn., to White River, Ark	180		2	14,333 33		
7505	White River to Vicksburgh, Miss	229		3	27,000 00		
7506	White River to Pine Bluff	182½		2	10,990 00		
7507	Pine Bluff to Little Rock	105		2	6,000 00		
7509	White River to Jacksonport	356		2	11,800 00		

C.—*Steamboat service as in operation on the 30th day of June*, 1873—Continued.

Number of route.	State and termini.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Remarks.
		Miles.	*Miles.*		*Dollars.*	*Dollars.*	
	ARKANSAS—Continued.						
7510	Jacksonport to Pocahontas	150		2	5,000 00		
7648	Memphis, Tenn., to Friar's Point, Ark	112		3	2,470 00		
			1,314½			77,593 33	
	MISSOURI.						
10516	Saint Louis to Memphis, Tenn	450		3	21,000 00		
			450			21,000 00	
	TENNESSEE.						
10216	London to Rockwood	45		6	4,000 00		
10217	Rockwood to Chattanooga	110		3	5,250 00		
			155			9,250 00	
	KENTUCKY.						
9601	Louisville to Cincinnati, Ohio	143		7	9,000 00		
9602	Louisville to Evansville, Ind	202		6	15,000 00		
9603	Evansville, Ind., to Cairo, Ill	200		6	15,000 00		
9744	Bowling Green to Evansville, Ind	225		1	2,400 00		
9769	Columbus to Cairo, Ill	20		14	3,600 00		
9771	Paducah to Eastport, Miss	268		2	6,000 00		
			1,058			51,000 00	
	OHIO.						
9061	Portsmouth to Cincinnati	117		3	4,500 00		
9062	Cincinnati to Maysville, Ky	74		3	2,000 00		
9063	Portsmouth to Huntington	51.35		6	6,334 09		
	Huntington to Gallipolis	36.65		3			
			279			12,834 09	

	MICHIGAN.						
12564	Detroit to Sault de Ste. Marie	350		2	1,600 00		During navigation, say 6½ months.
12648	Bay City to Alpena	143		6	8,000 00		April 16 to November 14 in each year.
12802	Grand Haven to Milwaukee, Wis	88		6	2,730 00		During navigation, say 7 months; pay estimated.
12839	Port Huron railroad station to Mackinaw	240		3	845 00		During navigation, say 7 months; pay estimated.
12850	Marquette to Hancock	75		6	13,000 00		May 1 to November 15 in each year.
12867	Cheboygan to Alpena	100		1	590 00		May 1 to November 14 in each year.
			996			26,765 00	
	WISCONSIN.						
13026	Oshkosh to New London	62½		6	1,200 00		May 1 to November 14 in each year; pay estimated.
13136	Berlin to Oshkosh	26		6	800 00		May 1 to November 15 in each year.
13336	Washington Harbor to Green Bay	96		1	170 00		May 1 to November 30 in each year.
			184½			2,170 00	
	CALIFORNIA.						
13712	San Francisco to Petaluma	51		6	4,000 00		
14799	San Francisco to Portland, Oreg	600			25,000 00		Three trips a month.
14873	San Francisco to San Diego	600			25,000 00		Five trips a month.
14882	San Francisco to Sacramento	230		6	8,000 00		
14906	San Francisco to San Diego	600			30,000 00		Five trips a month.
			2,081			92,000 00	
	OREGON.						
15101	Portland to Astoria	53 59		6 3	13,000 00		
15102	Portland to the Dalles	120		6	18,000 00		
			232			31,000 00	
	WASHINGTON TERRITORY.						
15406	Olympia to Victoria	66 108		3 2	16,235 00		
15412	Seattle to Whatcom	143		1	3,141 00		
15424	Portland, Oreg., to Sitka, Alaska	1,400			34,800 00		Once a month.
15438	Port Townsend to Semiahmoo	150		1	8,500 00		
			1,867			62,676 00	

JOHN L. ROUTT,
Second Assistant Postmaster-General.

D.—*Table showing the increase and decrease in mail transportation and cost during the year ended June 30, 1873.*

States and Territories.	CELERITY, CERTAINTY, AND SECURITY.				STEAMBOAT.				RAILROAD.				Total annual transportation.		Total annual cost.	
	Length of routes.		Cost.		Length of routes.		Cost.		Length of routes.		Cost.					
	Increase.	Decrease.	Increase.	Decrease.	Increase.	Decrease.	Increase.	Decrease.	Increase.	Decrease.	Increase.	Decrease.	Increase.	Decrease.	Increase.	Decrease.
	Miles.	*Miles.*			*Miles.*	*Miles.*			*Miles.*	*Miles.*			*Miles.*	*Miles.*		
Maine	106			$135							$1,714			13,487	$1,579	
New Hampshire		12		524		23		$745	29		1,532			12,732	263	
Vermont	4		$1,381						49		2,413		26,029		3,794	
Massachusetts	13		312						12		2,766		5,385		3,078	
Rhode Island																
Connecticut		10		369					45		2,412		49,389		2,043	
New York		70	3,461			12		450	293		121,529		213,578		124,540	
New Jersey*		93		24			$449		39			$5,288	19,053			$4,863
Pennsylvania*		788	43,325			6		289	325		72,121		169,208		115,157	
Delaware*		62		1,942					21		1,034			66,117		908
Maryland*		638	1,722						150		39,496		567,477		41,218	
West Virginia	102			402				†1,724	81		799		50,889			1,327
Virginia	243		3,666		251		2,600		38		4,698		233,217		10,964	
North Carolina	554		10,154		20		290		7		1,260		171,713		11,704	
South Carolina	‡24			540	35		1,200		69		9,079		63,310		9,739	
Georgia	622		6,349		155		3,600		23		706		113,938		10,655	
Florida	643		7,957			1,708		27,650	11		319			64,555		19,374
Alabama	284			15,801		487		25,305	156		17,457			§222		23,649
Mississippi	252		3,801						24		729		34,510		4,530	
Louisiana	415		30,117			307	4,225						53,436		34,342	
Texas		569		42,887	150		10,000		415		31,554		580,797			1,333
Arkansas		33		45,279			‖22,603			52		2,587	107,528			25,263
Missouri		158		129			‖7,000		592		55,408		74,748		62,279	
Tennessee	35		1,899						2		88		41,570		1,987	
Kentucky		179		1,553	20		3,600		95		12,749		19,243		14,796	
Ohio*		160	‖10,804			2	3,424		308		127,244		432,832		141,472	
Indiana		93	‖669						166		10,503		159,445		11,172	
Illinois		569		5,554		¶45		4,500	637		74,359		432,285		64,305	
Michigan		657		9,908		792		21,130	426		41,526			141,968	10,488	
Wisconsin		59	5,038			97		5,053	188		10,501		42,118		10,486	
Iowa		316		5,915					285		20,880			163,033	14,965	
Minnesota	169		5,794						138		2,987		118,472		8,781	
Nebraska	216		2,629						81		4,005		104,184		6,634	

Kansas	429	.....	32,409	.....	.....	.....	.....	.....	555	.....	75,384	.....	479,533	.....	107,793	.....
Nevada	394	.....	49,547	.....	.....	.....	.....	.....	34	.....	2,241	.....	196,450	.....	51,788	.....
California	517	.....	93,751	.....	600	.....	30,000	.....	140	.....	8,546	.....	368,857	.....	132,297	.....
Oregon	106	.....	10,233	.....	.....	.....	.....	.....	.....	.....	.....	.....	48,774	.....	10,233	.....
Washington Territory	78	.....	11,137	.....	150	.....	17,635	.....	.....	.....	.....	.....	67,268	.....	28,772	.....
Idaho Territory	93	.....	8,813	.....	.....	.....	.....	.....	.....	.....	.....	.....	30,472	.....	8,813	.....
Montana Territory	37	.....	7,998	.....	.....	.....	.....	.....	.....	.....	.....	.....	35,048	.....	7,998	.....
Dakota Territory	.....	169	2,068	.....	.....	.....	.....	.....	61	.....	4,611	.....	2,394	.....	6,679	.....
Wyoming Territory	55	.....	1,875	.....	.....	.....	.....	.....	.....	.....	.....	.....	5,720	.....	1,875	.....
Utah Territory	206	.....	12,435	.....	.....	.....	.....	.....	.....	.....	.....	.....	85,984	.....	12,435	.....
Colorado Territory	138	.....	17,562	.....	.....	.....	.....	.....	103	.....	5,113	.....	99,844	.....	17,212	.....
New Mexico Territory	64	.....	5,990	.....	.....	.....	.....	.....	.....	.....	.....	.....	36,276	.....	5,990	.....
Arizona Territory	200	.....	26,938	.....	.....	.....	.....	.....	.....	.....	.....	.....	46,488	.....	26,938	.....
Total	5,999	4,635	419,834	130,962	1,381	3,479	106,626	86,846	5,598	52	767,763	7,875	5,387,462	462,134	1,139,794	76,717
	4,635	.....	130,962	.....	.....	1,381	86,846	.....	52	.....	7,875	.....	462,134	.....	76,717	.....
	1,364	.....	288,872	.....	.....	2,098	19,780	.....	5,546	.....	759,888	.....	4,925,328	.....	1,063,077	.....

* Close of the first year of the new contract term.
† Route from Kanawha C. H. to Gallipolis reduced to three times a week.
‡ Corrected distance.
§ Occasioned by discontinuance of steamboat service, and increased transportation by "celerity, certainty, and security," and by railroad.
‖ Increased number of trips.
¶ Route from Shawneetown to Paducah; contract expired June 30, 1872.

JOHN L. ROUTT,
Second Assistant Postmaster-General.

E.—*Table showing the weight of the mails, the speed with which they are conveyed, the accom railroad routes in States (chiefly) in which*

[ABBREVIATIONS.—f. f., fixtures and furniture; f. f. c., fixtures and furniture complete; m. c., mail line; t. l. triple line; q. l., quadruple line; r. a., route agents; w. t., way trains. A number followed column refer to the order of the routes in this table.]

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles.	
1	Mass..	605	605	Boston, Springfield	Boston and Albany	101	30
2	Conn..	939	907	New Haven, New York.....	New York, New Haven and Hartford.	76½	30
3	N.Y.	1035, 1038	1207 1208	Buffalo, Hornellsville.....	Erie	91	32
4	Mass..	605	605	Boston, Albany.....	Boston and Albany.....	203	30
5	N. Y..	1002	1211	New York, Troy.....	New York Cent'l & Hudson River	150	....
6	Conn .	937	905	New Haven, Springfield	New York, New Haven and Hartford.	63 5-6	31
7	N. Y..	1079	1217	Albany, Buffalo.....	New York Cent'l & Hudson River	298	....
8	N. Y..	1001	1201	New York, Dunkirk.....	Erie	460	33
9	Mass..	605	605	Springfield, Albany.....	Boston and Albany	102	30
10	N. Y..	1282	1218	Rochester, Niagara Falls....	New York Cent'l & Hudson River	76	....
11	Ohio ..	9016	.....	Columbus, Xenia	Columbus and Xenia.....	55	27
12	Ohio ..	9046	.....	Cleveland, Cincinnati.....	Cleveland, Columbus, Cincinnati and Indianapolis.	245. 25	28
13	Ohio ..	9018	.....	Galion, Indianapolis.....	.....do	204	28
14	N. Y..	1035	1207	Buffalo, Attica.....	Erie	31	30
15	N. Y..	1038	1208	Attica, Hornellsville	.....do	60	33
16	Ohio ..	9002	.....	Pittsburgh, Chicago	Pittsburgh, Ft. Wayne & Chicago	469. 50	30
17	Md ...	3504	.....	Baltimore, Wheeling.....	Baltimore and Ohio.....	377	24
18	Pa	1605	2101	Allentown, Harrisburgh....	Philadelphia and Reading.....	90	26
19	Ohio ..	9036	.....	Columbus, Pittsburgh	Pittsburgh, Cincinnati & St. Louis	160	30
20	N. J...	1605	2101	New York, Easton.....	Central, of New Jersey.....	75	25
21	Mass..	601	601	Boston, Portsmouth.....	Eastern, of Massachusetts.....	56. 50	25
22	Ill	11405	.....	Chicago, Burlington	Chicago, Burlington and Quincy.	207. 70	24½
23	Miss ..	7001	.....	Canton, Jackson.....	Southern R. R. Association, lessees of Mississippi Central.	237	19
24	Ohio ..	9017	.....	Columbus, Indianapolis.....	Columbus, Chicago and Indiana Central.	188	30
25	Mass..	608	608	Boston, Providence	Boston and Providence.....	44	26
26	Vt	482	406	Rutland, Burlington	Rutland and Burlington	67. 50	22. 4
27	Vt	482	406	Bellows' Falls, Burlington ..	.....do	119. 50	22. 4
28	Me ...	114	124	Portland, Portsmouth.....	Eastern, of Massachusetts, (late Portland, Saco and Portsmouth.)	52	28
29	Mass..	604	604	Boston, Fitchburgh.....	Fitchburgh	52	30
30	Vt	412	401	Burlington, Rouse's Point...	Vermont Central and Vermont and Canada.	55. 50	22
31	Vt	461	403	Windsor, Burlington.....	Vermont Central.....	119	24
32	Ohio ..	9012	.....	Xenia, Dayton.....	Pittsburgh, Cincinnati & St. Louis	17	25
33	Ohio ..	9034	.....	Dayton, Richmond.....	.....do	42	25

modations for mails and agents, the trips per week, and the rates of pay per mile per annum, on the contract term expired June 30, 1873.

catchers; r. p. o., railway post-office; apt., apartment; b. c., baggage-car; s. l., single line; d. l., double by an asterisk (*) shows the equivalent in round trips. The figures in parentheses in the "Remarks"

Whole weight carried any distance for thirty days.			Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Outward.	Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Feet and inches.*		*Dolls.*		
.....	.....	.....	791, 473	26, 382	r. p. o., 40 by —, (average,) f. f. c., q l.	31	375 00	Part; residue $300, (9.)	1
302, 144	489, 905	792, 049	728, 511	24, 283	r. p. o., 40 by — f. f., d. l.; r. a. apt., 12 by 6, f. f., t. l.	43*	375 00	.....	2
.....	.....	.....	.....	20, 717	r. p. o., 42 by 11, 26 by 11, 16 by 11, f. f. c., s. l.	20½*	375 00	.....	3
518, 359	456, 627	974, 986	551, 840	18, 395	r. p. o., 40 by —, (average,) f. f. c., q l., to Springfield, 101 m.; 30 by — to 40 by —, f. f. c., d. l., residue, 102 m.	31	375 00	102 miles at $300	4
789, 203	240, 896	1,030,099	944,557	31,485	.....	....	350 00	In September, 1872. ...	5
374, 290	258, 025	632, 315	555, 510	18, 517	r. p. o., 40 by —, f. f., d. l.; r. a apt., 12 by 6, f. f., s. l.; and r. a. in b. c., s. l.	30	325 00	....	6
962, 727	466,909	1,429,636	1,065,191	35, 506	.....	....	300 00	In September, 1872....	7
1,153,703	331, 711	1,485,414	938, 193	31, 273	r. p. o., 50 by 10, f. f. c., d. l., and r. a. on w. t. 42 by 11, 26 by 11, 16 by 11, f. f. c.	20½*	300 00	.....	8
.....	.....	.....	316, 905	10, 563	r. p. o., 30 by — to 40 by —, f. f. c., d. l.	31	300 00	Part; residue $375, (1)	9
72, 746	42, 279	115, 025	82, 990	2, 766	.....	....	250 00	In September, 1872....	10
252, 612	234, 683	487, 295	483, 594	16, 119	20 by 8 4, f. f., s. l.....	25	225 00	In March, 1872.....	11
232, 751	128, 753	361, 504	186, 623	6, 220	r. p. o., 39 2 by 9 2, f. f. c., s. l.	12	225 00	In April, 1873.....	12
93, 336	43, 232	136, 568	103, 326	3, 444	r. p. o., 39 2by 9 2., f. f. c., s. l.	12	215 00	In April, 1873. Old pay. See readjustment.	13
.....	.....	.....	854, 388	28, 479	r. p. o., 42 by 11, 26 by 11, 16 by 11, f. f. c., s. l.	22½	200 00	Part; residue $100, (60.)	14
436, 808	78, 416	515, 224	503, 049	16, 768	r. p. o., 42 by 11, 26 by 11, 16 by 11, f. f. c., s. l.	19½	200 00	.....	15
302, 075	256, 846	558, 921	411, 304	13, 710	20 by 8 4, f. f., d. l.....	26	200 00	In March, 1872.....	16
593, 793	130, 865	724, 658	377, 399	12, 579	16 8 by 8, f. f. c., s. l.....	18	200 00	In March, 1873.....	17
350, 946	47, 505	398, 451	355, 776	11, 859	14 by 9, 11 by 8 6, f. f., s. l; through mails in through baggage-cars between N. York and Harrisburgh.	19¼*	200 00	In October, 1872. Part; route divided.	18
106, 177	268, 666	374, 843	342, 907	11, 430	20 by 8 4, f. f., s. l.....	26	200 00	In March, 1872. Main route; branch $50, (197.)	19
342, 640	46, 149	388, 789	340, 726	11, 357	12 by 9, d.l.; through mail in through car between New York and Harrisburgh.	19	200 00	In July, 1872. Part; route divided.	20
209, 727	184, 496	394, 223	332, 205	11, 073	r. p. o., 40 by 8 9, f. f., d. l.; r. a. apt., 15 by 6, s. l.	47*	200 00	.....	21
237, 879	75, 378	313, 257	219, 392	7, 313	r. p. o., 36 by 9, f. f. c., s. l ...	20½*	200 00	In Dec., 1872. Main r'te; branches $50, (189, 244.)	22
42, 597	276, 387	318, 984	208, 664	6, 954	r. p. o., 45 by —, f. f. c., s. l..	13	200 00	In March. 1873.....	23
134, 598	60, 442	195, 040	158, 383	5, 279	20 by 8 4, f. f., d. l.....	12	200 00	In March, 1872.....	24
40, 292	22, 981	63, 273	34, 790	1, 159	No apt.; no r. a	27¼*	200 00	.....	25
.....	.....	.....	124, 525	4, 150	25 by 9 3, f. f., s. l.....	15*	180 81	Part; residue $100, (66.)	26
98, 525	71, 328	169, 853	93, 948	3, 131	25 by 9 3. f. f., s. l	15*	180 81	.....	27
143, 757	165, 923	309, 680	288, 337	9, 611	r. p. o., 40 by 8 9, f. f., d. l.; r. a. apt., 15 by 6, d. l.	18	175 72	.....	28
87, 934	48, 715	136, 649	108, 616	3, 620	r. p. o., 25 by 8, 11 by 66, 12 by 7, 12 by 6, 15 by 7, f. f., s. l.	18	175 00	.....	29
138, 211	90, 006	228, 217	96, 240	3, 208	r. p. o., 24 by 9 7, 25 by 9 7, f. f. c., s. l., 24½ m.; r. a. apt., 25 by 9 3, 13 7 by 9 7, f. f., s. l., res.	14⅝*	175 00	.....	30
142, 101	121, 478	263, 579	95, 722	3, 190	r. p. o., 24 by 9 7, 25 by 9 7, f. f. c., s. l., 93 m.; r. a. apt. 25 by 9 3, 22 6 by 9 3, f. f., d. l. 14 m., s. l., res.	12¼*	175 00	.....	31
10, 582	10, 714	21, 296	20, 611	687	20 by 8 4, f. f., s. l.....	30	175 00	In March, 1872.....	32
9, 097	4, 168	13, 265	11, 417	380	20 by 8 4, f. f., s. l..... ...	12	175 00	In March, 1872.....	33

E.—*Table showing the weight of the mails, the speed with which they*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles.	
34	Mass..	604	.....	Boston, Fitchburgh.....	Fitchburgh	52	30
35	Mass..	603	603	Boston, Nashua.....	Boston and Lowell and Nashua and Lowell.	42	25
36	Mass.	702	648	Springfield, South Vernon Junction.	Connecticut River.....	50	25
37	Conn..	936	904	New Haven, New London..	New York, New Haven and Hartford.	50	29
38	S. C...	5604	.....	Florence, Wilmington	Wilmington, Columbia & Augusta	109. 70	22
39	Ill.....	11417	.....	Galesburgh, Quincy.....	Chicago, Burlington and Quincy..	100	25
40	Ind ...	12028	.....	Lafayette, Kankakee	Cincinnati, Lafayette and Chicago	57. 35	30
41	N. Y..	1031	1255	Canandaigua, Elmira	Northern Central.....	68. 50	25
42	Mass..	602	602	Boston, South Berwick Junc.	Boston and Maine.....	75	25
43	Vt....	487	407	Brattleboro', Bellows' Falls.	Vermont Valley.....	24	25
44	Vt....	481	405	Bellows' Falls, Windsor.....	Sullivan	25	23
45	Me....	9	2	Danville Junction, Bangor..	Maine Central	110	24
46	Me ...	116	6	Portland, South Paris.....	Grand Trunk, of Canada.....	48	21
47	Me ...	181	9	Bangor, New Brunswick Line	Consolidated European and North America, late European and North American.	118. 25	20
48	R. I...	802	802	Providence, New London ...	New York, Providence & Boston.	63. 75	30
49	Ohio ..	9015	.....	Columbus, Delaware	Cleveland, Columbus, Cincinnati and Indianapolis.	24. 75	25
50	N. Y..	1017	1259	Troy, North Adams, State Line.	Troy and Boston.....	55. 50	30
51	Mass ..	677	641	Taunton, Mansfield.....	Taunton Branch	12	25
52	Mass ..	689	645	Fitchburgh, Bellows' Falls..	Cheshire and Ashuelot.....	64	27
53	N. Y..	1023	1258	Rouse's Point, Canada Line	Champlain and St. Lawrence.....	2. 25	23
54	N. Y..	1026	1227	Rome, Ogdensburgh.....	Rome, Watertown & Ogdensburgh.	142	30
55	N. Y..	1026	1227	DeKalb Junction, Pottsdam Junction.	.....do	25	30
56	N. Y..	1338*a*	1250	Fredonia, Dunkirk Station..	Dunkirk and Fredonia.....	3. 50	7
57	Me ...	115	5	Portland, Augusta.....	Maine Central, (late Portland & Kennebec.)	64	24
58	Me ...	115	5	Brunswick, Bath.....	Maine Central, (late Portland and Kennebec.)	9	22
59	N. Y..	1035	1207	Buffalo, Corning	Erie	142	30
60	N. Y..	1035	1207	Attica, Corning	.....do	111	30
61	Mass .	690	646	Fitchburgh, Brattleboro', Miller's Falls, Hoosac Tunnel, and Turner's Falls.	Vermont and Massachusetts.....	113	21
62	Vt....	452	402	White River Junction, Derby Line.	Connecticut and Passumpsic Rivers.	114. 17	25
63	Ala...	6612	.....	Mobile, Montgomery.....	Mobile and Montgomery.....	187	20
64	Iowa..	11003	.....	Burlington, East Plattsmouth	Burlington and Missouri River ..	279. 14	21
65	Me ...	116	6	South Paris, Canada Line...	Grand Trunk, of Canada	117	21
66	Vt....	482	406	Bellow's Falls, Rutland.....	Rutland and Burlington	52	22. 4
67	N. Y..	1027	1213	Syracuse, Rochester	New York Cent'l & Hudson River	104	....
68	Conn	926	902	New London, Palmer	Vermont Central, operating New London Northern.	65	22
69	Mass .	683	643	Worcester, Nashau.....	Worcester and Nashua	46. 25	23
70	Ala...	6604	.....	Montgomery, Calera	South and North Alabama.....	63. 55	20
71	S. C...	5604	.....	Columbia, Florence	Wilmington, Columbia & Augusta	82. 08	22
72	N. H..	253	252	Concord, Wells River	Boston, Concord and Montreal ...	93	25
73	Vt....	508	408	Saint Albans, Canada Line..	Vermont Central and Vermont and Canada.	17	25½
74	N. Y..	1006	1233	New York, Greenport.....	Long Island	100. 50	25
75	Conn .	955	911	Waterbury, Providence.....	Hartford, Providence and Fishkill	122. 50	22

are conveyed, the accommodations for mails and agents, &c.—Continued.

Whole weight carried any distance for thirty days.			Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Outward.	Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Feet and inches.*		*Dolls.*		
56, 901	25, 686	82, 587	63, 635	2, 357	r. p. o., 25 by 7, 24 by 6 6, s. l.; r. a. apt., 7 6 by 15, 6 6 by 11, f. f., s. l.	18	153 84	In July, 1872, 27 days.	34
113, 819	71, 533	185, 352	164, 357	5, 478	22 by 7, f. f., s. l.	18	150 00	.....	35
71, 671	59, 003	130, 674	103, 040	3, 434	23 4 by 6 5, 21 8½ by 6 5, 20. 9 by 6 9½, f. f., d. l.	17*	150 00	$300 for supply of Chicopee Falls.	36
74, 840	26, 786	101, 626	90, 100	3, 003	12 by 6, f. f., s. l.	24	150 00	.....	37
24, 070	61, 127	85, 197	80, 660	2, 688	16 6 by 8 4, f. f. c., s. l.	14	150 00	In October, 1872. Part; residue $100, (71.)	38
55, 473	26, 115	81, 588	66, 424	2, 214	r. p. o., 29 by 8 10, f. f. c. and m. c., s. l.	12	150 00	In November, 1872.	39
40, 484	22, 121	62, 605	57, 928	1, 931	14 by 8, 8 by 8, f. f., s. l.	12	150 00	.....	40
35, 684	39, 662	75, 346	56, 738	1, 891	12 by 9 6, f. f., d. l.	12	150 00	In June, 1872	41
91, 844	54, 920	146, 764	56, 504	1, 883	14 by 6, f. f., d. l.	12	150 00	Main route; branch $50, (161.)	42
56, 386	49, 942	106, 328	103, 777	3, 459	22 6 by 9 3, f. f., d. l.	12	140 00	.....	43
62, 022	50, 935	112, 957	103, 435	3, 447	22 6 by 9 3, f. f., d. l.	12	140 00	.....	44
92, 041	51, 138	143, 179	110, 271	3, 675	r. p. o., 42 by 9, f. f. c., d. l., beyond Waterville, 55 m.; r. a. apt., 16 by —, f. f., s. l., to Waterville, 55 m.	9*	125 00	.....	45
53, 502	42, 464	95, 966	84, 341	2, 811	18 by 8, f. f., s. l.	15*	125 00	Part; residue $100, (65.)	46
60, 563	24, 701	85, 264	71, 041	2, 368	r. p. o., 20 by 9, f. f., s. l.	12	125 00	.....	47
27, 955	57, 397	85, 352	66, 270	2, 209	11 by 6, f. f., s. l.	22*	125 00	.....	48
20, 517	33, 708	54, 225	50, 470	1, 682	b. c.; no r. a	12	125 00	In April, 1873	49
69, 324	41, 857	111, 181	48, 738	1, 624	18 by 8, f. f., s. l.	24	125 00	.....	50
9, 903	16, 472	26, 375	25, 733	857	b. c.; no r. a	37	125 00	$300 per annum for m. m. service.	51
46, 901	31, 387	78, 288	64, 575	2, 152	24 by 8 8, f. f., s. l.	18	117 18	.....	52
463	731	1, 194	1, 194	40	b. c.; no r. a	6	116 66	.....	53
75, 316	39, 122	114, 438	52, 417	1, 747	23 by 9, 19 by 8 10, f. f., s. l.	15*	115 00	Main r'te; branch $115, (55.)	54
8, 977	6, 752	15, 729	7, 065	235	no r. a	12	115 00	Branch; main route $115, (54.)	55
3, 370	4, 157	7, 527	7, 527	250	In care of conductor	27*	114 28	Street R.R.	56
66, 164	108, 762	174, 926	124, 888	4, 162	r. p. o., 42 by 9, f. f. c., s. l.; r. a. apt., 16 by —, f. f. c., s. l.	12	113 35	Main route; branch $113.35, (58.)	57
13, 890	5, 887	19, 777	19, 777	659	apt. in b. c., t. l.	18	113 35	Branch; main route $113.35, (57.)	58
602, 946	293, 563	896, 509	470, 853	15, 695	r. p. o., 42 by 11, 26 by 11, 16 by 11, f. f. c., s. l.	22½	100 00	31 miles at $200	59
.....	.....	.....	363, 740	12, 124	.....do	22½	100 00	Part; residue $200, (14)	60
154, 389	145, 770	300, 159	94, 613	3, 153	15 by 7, 25 by 7, f. f., d. l.	12	100 00	.....	61
69, 656	51, 097	120, 753	88, 301	2, 942	23 by 9, f. f., s. l.	12	100 00	.....	62
31, 726	59, 630	91, 356	84, 303	2, 810	8 by 8, f. f., s. l.	14	100 00	In November, 1872.	63
82, 542	43, 619	126, 161	77, 954	2, 598	r. p. o., 23 by 9, f. f. c., s. l.	12	100 00	In Sept., 1872. Main route; br'ch $50, (164.)	64
48, 326	38, 141	86, 467	76, 503	2, 550	18 by 8, f. f., s. l.	9*	100 00	Part; residue $125, (46)	65
.....	.....	.....	55, 295	1, 843	25 by 9 3, f. f., s. l.	15*	100 00	Part; res. $180.81, (26)	66
63, 721	42, 547	106, 268	43, 208	1, 440	.....	....	100 00	In September, 1872	67
35, 140	35, 001	70, 141	39, 964	1, 332	11 5 by 5 8, f. f., s. l.	18	100 00	35 miles at $75	68
33, 746	25, 196	58, 942	34, 364	1, 145	9 by 6, f. f., s. l.	18	100 00	.....	69
.....	.....	.....	31, 141	1, 004	13 7 by 7 5, fixtures, s. l.	7	100 00	Part; in July, 1873; 31 days.	70
12, 815	18, 862	31, 677	26, 622	887	16 6 by 8 4, f. f. c., s. l.	14	100 00	In Oct., 1872. Part; residue $150, (38.)	71
25, 869	14, 825	40, 694	26, 049	868	18 by 7 8, f. f., s. l.	6	100 00	.....	72
17, 131	7, 816	24, 947	24, 947	831	17 by 9 3, f. f., s. l.	6	100 00	.....	73
30, 047	15, 572	45, 619	22, 962	765	10 by 15, f. f., s. l.	12	100 00	$2,000 for m. m. service at New York.	74
44, 176	40. 869	85, 045	18, 766	625	14 2 by 6 6, f. f., s. l.	36	100 00	.....	75

E.—*Table showing the weight of the mails, the speed with which they*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles.	
76	Me ...	84	4	Calais, Princeton.....	Saint Croix and Penobscot, (late Lewy's Island.)	21	15
77	Tenn .	10008	.....	Guthrie, Nashville.....	Saint Louis and Southeastern....	48	21
78	Ill	11900	.....	East Saint Louis, Evansville.	.....do	164. 75	23
79	N. Y..	1022	1242	Rouse's Point, Ogdensburgh.	Ogdensburgh and Lake Champlain	119	23. 6
80	Ind ...	12017	.....	Indianapolis, Pekin	Indianapolis, Bloomington and Western.	203	25
81	N. Y..	1028	1257	Syracuse, Binghamton	Syracuse, Binghamton and New York.	80	25
82	N. Y..	1040	1230	Owego, Ithaca	Delaware, Lackawanna & Western	35	24
83	Conn .	945	910	South Norwalk, Danbury ...	Danbury and Norwalk.....	23. 50	30
84	Conn .	942	908	Bridgeport, Winsted	Naugatuck	62	22
84*a*	Ind ...	12012	.....	Evansville, Terre Haute	Evansville and Crawfordsville...	110	25
85	Me ...	204	.....	Bath, Rockland	Knox and Lincoln.....	49	22
86	Mass .	678	.....	Taunton, New Bedford.....	New Bedford and Taunton.....	20. 50	27
87	Conn .	943	909	Bridgeport, State Line, Pittsfield.	Housatonic	126. 50	22
88	Ill	11431	.....	Quincy, Louisiana	Quincy, Alton and Saint Louis. .	43	25
89	N. Y..	1014	1247	Central Bridge, Schoharie...	Schoharie Valley	5	15
90	Conn .	938	906	New Haven, Williamsburgh.	New Haven and Northampton...	83	28
91	Mass .	696	647	Palmer, Miller's Falls.....	Vermont Central, operating New London Northern.	35	23
92	Ky ...	9612*a*	.....	Evansville, Guthrie.....	Saint Louis and Southeastern....	110. 66	21
93	R. I...	801	801	Providence, Worcester.....	Providence and Worcester.....	44	20
94	Me ...	19	34	Farmington, Brunswick	Maine Cent'l, (late Androscoggin)	71. 50	20
95	N. Y..	1029	1256	Syracuse, Oswego.....	Oswego and Syracuse.....	35. 50	22
96	Mass .	688	644	Sterling Junct'n, Fitchburgh	Boston, Clinton and Fitchburgh..	14	27½
97	Mass .	640	631	South Framingham, Pratt's Junction.	.....do	29	27½
98	Ill	11002	.....	Keokuk, Burlington	Chicago, Burlington and Quincy .	42. 75	21¼
99	Pa	1850	2445	Miles Grove, Newcastle	Erie and Pittsburgh.....	83	30
100	N. Y..	1032	1205	Rochester, Avon	Erie	18	30
101	Conn .	925	901	Norwich, Worcester	Norwich and Worcester.....	60	20
102	Dak ..	13929	.....	Sioux City, Vermillion.....	Dakota Southern	35. 34	20
103	N. Y..	1021	1243	Plattsburgh, Canada Line...	New York and Canada, (late Montreal and Plattsburgh.)	23	24
104	Ohio ..	9033	.....	Morrow, Dresden	Cincinnati & Muskingum Valley	149. 4	....
105	Me ...	1	1	Augusta, Skowhegan	Maine Central, (late Portland and Kennebec.)	39	22
106	Pa ...	1820	2420	Blossburgh, Corning	Tioga.....	39. 88	16
107	Ala ...	6604	.....	Montgomery, Decatur.....	South and North Alabama.....	182. 85	20
108	N. Y..	1016	1212	Troy, Schenectady	New York Cent'l & Hudson River	22	....
109	Pa	2409	.....	Honesdale, Lackawaxen	Erie	25	28
110	Conn .	932	903	Middletown, Berlin Depot...	New York, New Haven and Hartford.	10	23
111	N. Y..	1037	1216	Buffalo, Lewiston	New York Cent'l & Hudson River	29	....
112	Pa	1849	2429	Newcastle, Homewood	Pittsburgh, Fort Wayne and Chicago, lessees Newcastle and Beaver Valley.	15	24
113	Conn .	938	906	Farmington, New Hartford .	New Haven and Northampton...	16	28
114	Conn .	942	908	Waterbury, Watertown.....	Naugatuck	5. 75	22
115	Pa	1820	2420	Blossburgh, Fall Brook	Tioga.....	6. 85	16
116	N. Y..	1561	1273	Fonda, Gloversville.....	Fonda, Johnstown & Gloversville.	10	20
117	N. Y	1025 1181	1283	Utica, Watertown	Utica and Black River.....	92. 72	25

are conveyed, the accommodations for mails and agents, &c.—Continued.

Whole weight carried any distance for thirty days.			Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Outward.	Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Feet and inches.*		*Dolls.*		
1,337	1,515	2,852	2,109	70	8 by 6, fixtures; no r. a	6	100 00	.....	76
.....	.....	.....	38,805	1,293	10 by 8, f. f., s. l	12	90 00	.....	77
.....	.....	.....	33,160	1,105	.....do.....	12	90 00	Main route; branch $40, (259.)	78
39,621	27,155	66,776	32,947	1,098	13 8 by 7 3, f. f., s. l.....	9*	90 00	Includes side service	79
28,620	26,304	54,924	22,734	757	12 8 by 8, f. f. c., s. l.....	12	90 00	In November, 1872	80
22,906	17,890	40,796	20,525	684	Separate car.....	12	90 00	.....	81
12,642	6,185	18,827	15,440	514	8 by 7 8, f. f., s. l.....	12	85 75	28 miles more to Aurora by steamboat.	82
7,451	12,856	20,307	14,272	475	10 6 by 5 6, 9 by 6, f. f., d. l..	15½*	85 11	Main route; branches $50 (212) and $30, (271.)	83
20,808	38,747	59,555	28,965	965	10 6 by 6 6, f. f., s. l..... ..	12	85 00	Main route; branch $75, (114.)	84
17,721	35,721	53,442	28,376	945	12 3 by 7 6, f. f., s. l.....	12	85 00	.....	84*a*
20,044	10,999	31,043	20,523	684	13 by 6 8, f. f., d. l	12	85 00	In February, 1873.....	85
10,756	9,536	20,292	19,767	658	Locked room; no r. a.....	31*	85 00	$612.50 for m. m. service. In June, 1872.	86
35,198	23,822	59,020	22,888	762	11 6 by 6, f. f., s. l.....	12	80 00	.....	87
7,576	12,754	20,330	17,365	579	20 by 10, f. f. c., s. l	12	80 00	In November, 1872....	88
4,528	3,694	8,222	8,222	274	apt. in passenger-car; no r. a	12	80 00	.....	89
43,737	34,542	78,279	48,629	1,620	12 by 10, f. f., d. l	13*	75 00	Main route; branch $75, (113.)	90
23,795	25,779	49,574	45,474	1,515	11 5 by 7 8, f. f., s. l.....	6	75 00	.....	91
.....	.....	.....	35,161	1,172	10 by 8, f. f., s. l	12	75 00	In June, 1873.....	92
28,298	28,063	56,361	28,856	961	14 by 6 5, f. f., s. l.....	18	75 00	$1,500 per annum for m. m. service.	93
18,334	20,782	39,116	27,589	919	12 by —, f. f., s. l	6	75 00	.....	94
18,913	12,179	31,092	22,794	759	6 by 6, hooks; no r. a	18	75 00	.....	95
16,665	14,716	31,381	22,068	735	No apt.; no r. a.....	18	75 00	.....	96
17,384	15,359	32,743	21,157	705	40 by —, f. f., d. l	12	75 00	.....	97
7,289	16,625	23,914	19,723	657	16 by 9, f. f. c., s. l	12	75 00	In November, 1872	98
23,879	27,768	51,647	18,840	628	20 by 8 4, f. f., s. l.....	12	75 00	In March, 1872	99
7,128	12,210	19,338	18,061	602	b. c.; no r. a	12	75 00	.....	100
18,927	16,918	35,845	17,370	579	12 by 7, f. f. c., s. l	15*	75 00	Weight in Mar., 1872. $546 for r. a.	101
11,051	6,829	17,880	14,502	483	12 by 7 6, f. f., s. l.....	6	75 00	In December, 1872	102
6,132	10,530	16,662	13,462	448	no apt.; no r. a	6	75 00	Returns not certified.	103
22,348	17,879	40,227	13,191	440	11 6 by 7 3, f. f., s. l.....	6⅔*	75 00	In October, 1872.....	104
13,621	4,170	17,791	12,474	415	r. p. o., 42 by 9, f. f. c., d. l., to Fairfield, 22 miles; r. a. apt. 16 by—, f. f., s. l., res., 17 miles.	2⅔*	75 00	.....	105
8,641	16,647	25,288	12,209	406	11 by 7, f. f. c., s. l	12	75 00	Main route; branches $75 (115) and $50, (240, 247.) In January, 1873.	106
10,128	15,995	26,123	12,069	402	13 7 by 7 5, fixtures, s. l.....	7	75 00	In April, 1873. 63.55 miles at $100.	107
7,414	3,553	10,967	9,457	315	....	....	75 00	In September, 1872....	108
6,960	2,862	9,822	7,943	264	b. c.; no r. a	12	75 00	.....	109
3,536	4,525	8,061	7,511	250	.....do.....	21	75 00	.....	110
4,268	4,143	8,411	5,304	176	....	....	75 00	In September, 1872....	111
3,402	3,883	7,285	5,189	172	no r. a	18	75 00	In March, 1872.....	112
4,535	2,661	7,196	4,308	143	12 by 10, f. f., d. l.....	12	75 00	Branch; main route $75, (90.)	113
2,555	1,273	3,828	3,429	114	In charge of conductor	6	75 00	Branch; main route $85, (84.)	114
1,155	638	1,793	1,793	59	11 by 7, f. f. c., s. l	12	75 00	Branch; main route $75, (106.) In Jan. 1873.	115
6,143	11,205	17,348	13,529	450	No sep'ate car or apt.; no r. a	12	70 00	Pay includes side service.	116
18,349	10,724	29,073	11,416	380	13 by 9, f. f., s. l	12	67 80	18.22 miles at $50.....	117

E.—*Table showing the weight of the mails, the speed with which they*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles.	
118	N. Y..	1046	1251	Skaneateles Junction, Skaneateles.	Skaneateles	5.50	15
119	N. Y..	1525	1278	Cooperstown, Cooperstown Junction.	Cooperstown and Susquehanna Valley.	16	20
120	Mass .	732	654	East Salisbury, Amesbury..	Eastern, of Massachusetts	4	20
121	Mass .	721	650	Pittsfield, North Adams	Pittsfield and North Adams	21	25
122	Pa	1864	2456	Pittsburgh, Washington	Pittsburgh, Cincinnati and Saint Louis.	22.8	20
123	Me ...	9*a*	3	Newport, Dexter	Maine Central	14	20
124	N. Y..	1033	1206	Avon, Dansville	Erie	30.73	28
125	N. H..	278	257	Nashua, Wilton.	Boston and Lowell and Nashua and Lowell.	16	25
126	Me ...	117	7	Portland, Rochester	Portland and Rochester	52	20
127	R. I...	803	803	Providence, Bristol.	Providence, Warren and Bristol..	15.50	18
128	Iowa..	11012	.....	Burlington, Plymouth	Burlington, Cedar Rapids and Minnesota.	228	26
129	Mass .	672	.....	New Bedford, West Wareham.	New Bedford and Taunton	16.25	25
130	N. Y..	1034	1254	Suspension Bridge, Detroit..	Great Western, of Canada	229	27
131	Vt....	521	410	West Concord, Hyde Park ..	Portland and Ogdensburgh	59.56	20
132	Ill	11900	.....	East Saint Louis, Evansville.	Evansville, Henderson and Nashville.	164.75	23
133	Mass .	745	660	Worcester, Gardner	Boston, Barre and Gardner	27	25
134	N. Y..	1582	1263	Port Henry, Leicester Junction.	Vermont Central, and Vermont and Canada.	31.5	19
135	Ill	11433	.....	Beardstown, Shawneetown..	Springfield and Illinois Southeastern.	229.7	22
136	N. J ..	2126	.....	New York, Pemberton Junction.	New Jersey Southern	84.6	27½
137	N. Y..	1228	1229	Utica, North Norwich	Delaware, Lackawanna & Western	48.5	21
138	Mass .	620	619	Salem, Marblehead	Eastern, of Massachusetts	4	20
139	N. Y..	1042	1225	Oswego, Richland	Rome, Watertown and Ogdensburgh.	28.50	30
140	N. H..	331	261	Groveton Junction, Wells River.	Boston, Concord and Montreal	53.1	25
141	Pa ...	1875	2466	Lawrenceville, Wellsborough	Fall Brook Coal Company	23.5	16½
142	Tex...	8577*a*	.....	Bremond, Waco	Houston and Texas Central, operating Waco and Northwestern Railway.	44.56	18
143	N. Y..	1044	1282	New York, Patchogue	South Side	55	25
144	Ill	11415	.....	Peoria, Galesburgh	Chicago, Burlington and Quincy..	54	21½
145	Mass .	619	618	Salem, Gloucester	Eastern, of Massachusetts	16	20
146	Mass .	735	656	Mansfield, South Framingham.	Boston, Clinton and Fitchburgh..	22	27½
147	Mass .	637	628	Ayer, Mason Village	Fitchburgh	23	25
148	Md ...	3507	.....	Lake Roland, Hagerstown ..	Western Maryland	81.4	21½
149	N. Y..	1024	1226	Watertown, Cape Vincent ..	Rome, Watertown and Ogdensburgh.	26	30
150	Conn .	975	913	New Haven, Middletown....	New Haven, Middletown & Willimantic.	24	24
151	N. Y..	1405	1228	Chenango Forks, Norwich ..	Delaware, Lackawanna & Western	30.69	21
152	Mass .	703	649	South Vernon Junction, Keene.	Cheshire and Ashuelot	24	22
153	Mass .	641	632	South Framingham, Milford.	Boston and Albany	12	25
154	N. Y..	1043	1252	Brocton, Corry	Buffalo, Corry and Pittsburgh	45.30	25
155	Kans .	14212	.....	Atchison, Lincoln	Atchison and Nebraska	152.28	20
156	N. Y..	1524	1279	Chatham Village, Bennington	Harlem Extension	57.8	20
157	Me ...	188	10	Old Town, Guilford	Bangor and Piscataquis	48.1	13.7
158	R. I...	821	804	Warren, Fall River	Fall River, Warren & Providence	7	24
159	Conn .	977	915	New Haven, Ansonia	New Haven and Derby	13.50	20
160	N. Y..	1524	1279	Chatham Village, Bennington	Harlem Extension	57.8	20
161	Mass .	602	602	Rollingsford, Great Falls....	Boston and Maine	3	25
162	N. Y..	1545	1231	Cassville Junction, Richfield Springs.	Delaware, Lackawanna & Western.	21	21
163	N. Y..	1010	1204	Newburgh, Chester	Erie	32.50	30
164	Iowa..	11003	.....	Red Oak, East Nebraska City	Burlington and Missouri River ..	50	17

are conveyed, the accommodations for mails and agents, &c.—Continued.

Whole weight carried any distance for thirty days.			Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Outward.	Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Feet and inches.*		*Dolls.*		
2, 942	2, 069	5, 011	4, 492	150	15 by 9; no f. f., d. l.....	12	63 63	.....	118
5, 143	6, 552	11, 695	8, 719	290	no apt.; no r. a.....	12	62 50	.....	119
3, 190	1, 993	5, 183	4, 658	155	b. c.; no r. a.....	15*	62 50	.....	120
7, 258	6, 136	13, 394	9, 391	313	.....do.....	12	60 00	$315 for m. m. service..	121
7, 967	3, 674	11, 641	9, 215	307	20 by 8 4, f. f., s. l.....	12	60 00	In March, 1872. Pay from Mansfield Valley, 22.80 miles.	122
3, 683	2, 118	5, 801	5, 273	175	b. c.; no r. a	12	60 00	.....	123
7, 689	9, 676	17, 365	8, 708	290	.....do.....	12	59 37	.....	124
9, 362	6, 243	15, 605	12, 084	402	36 cubic feet; no r. a	18	56 25	.....	125
12, 692	8, 383	21, 075	7, 362	245	13 by 6, 12 by 7, d. l.....	12	55 55	$420 for mail-messenger service.	126
10, 143	3, 577	13, 720	10, 213	340	no separate car; mails in express department.	12	55 16	.....	127
26, 872	23, 450	50, 322	15, 430	514	12 by 10, f. f., s. l.....	6	55 00	.....	128
3, 443	5, 264	8, 707	7, 297	242	locked room; no r. a.....	15*	55 00	In June, 1872.....	129
50, 543	27, 727	78, 270	78, 270	2, 609	throgh b. c. under U. S. seal	20¾*	50 00	.....	130
44, 583	39, 274	83, 857	65, 801	2, 193	15 by 6 6, f. f., s. l.....	6	50 00	.....	131
32, 433	18, 834	51, 267	24, 360	812	12 by 9, f. f., s. l	9*	50 00	In Dec., 1872. Main route; br'ch $50, (237.)	132
12, 746	11, 049	23, 795	21, 222	707	10 by —, fixtures, d. l	12	50 00	.....	133
8, 569	13, 391	21, 960	18, 414	613	14 by 9 3, f. f., s. l..... ...	6	50 00	.....	134
41, 523	36, 858	78, 381	18, 254	608	11 by 7, f. f., s. l	6	50 00	In February, 1873.....	135
20, 598	13, 687	34, 285	15, 071	602	6 by 8, f. f., s. l	12	50 00	25 days; in Aug., 1872. Main route; branches $50, (201, 208.)	136
23, 450	14, 357	37, 807	17, 119	570	19 3 by 6 7, f. f., m. c., s. l....	12	50 00	.....	137
2, 576	13, 594	16, 170	16, 170	539	b. c.; no r. a.....	21*	50 00	.....	138
10, 642	10, 326	20, 968	16, 032	534	no r. a	15	50 00	.....	139
11, 467	15, 589	27, 056	15, 439	514	18 by 7 8, f. f., s. l.....	6	50 00	.....	140
10, 260	6, 160	16, 420	13, 028	434	11 by 7, f. f. c., s. l	12	50 00	In Jan., 1873. Part; residue $50, (224.)	141
8, 596	4, 874	13, 470	12, 245	407	end of b. c., fixtures, s. l ...	6	50 00	.....	142
10, 693	7, 686	18, 379	11, 049	368	10 by 8, fixtures, d. l	12	50 00	.....	143
13, 072	8, 760	21, 832	10, 811	360	24 8 by 8 10, f. f. c., m. c., s. l	20½*	50 00	In November, 1872	144
7, 687	4, 908	12, 595	10, 805	360	b. c.; no r. a.....	12	50 00	.....	145
8, 765	6, 406	15, 171	10, 189	339	no apt.; no r. a.....	15*	50 00	.....	146
8, 608	5, 823	14, 431	9, 966	332	6 by 6, f. f., s. l	12	50 00	.....	147
15, 452	7, 629	23, 081	9, 849	328	9 by 10, f. f., d. l	12	50 00	In October, 1872.....	148
8, 606	4, 249	12, 855	9, 633	321	no r. a.....	12	50 00	.....	149
8, 421	5, 164	13, 585	9, 603	320	apt. in b. c.; no r. a	18	50 00	.....	150
7, 271	5, 860	13, 131	9, 458	315	19 3 by 6 7, f. f., m. c., s. l ...	12	50 00	.....	151
4, 995	11, 541	16, 536	9, 125	304	13 8 by 7 1, f. f., s. l.....	12	50 00	.....	152
5, 086	4, 417	9, 503	8, 995	300	b. c.; no r. a.....	12	50 00	$300 for mail-messenger service.	153
8, 397	5, 170	13, 567	8, 931	297	12 10½ by 5 7¼, s. l	15*	50 00	.....	154
13, 310	8, 574	21, 884	8, 827	294	16 by 9, f. f., s. l	6	50 00	In November, 1872	155
7, 734	10, 097	17, 831	8, 442	281	18 by 6, fixtures, s. l.....	7⅞*	50 00	In September, 1872....	156
8, 139	4, 492	12, 631	8, 450	281	14 by 6 3, f. f., s. l.....	6	50 00	.....	157
6, 066	2, 038	8, 104	8, 104	270	express car; no r. a	6	50 00	.....	158
6, 134	6, 863	12, 997	8, 078	269	no separate car; no. r. a ...	15*	50 00	.....	159
7, 813	12, 416	20, 229	7, 906	263	18 by 6, fixtures, s. l.....	7⅞*	50 00	.....	160
4, 206	3, 434	7, 640	7, 640	254	b. c.; no r. a.....	12	50 00	Branch; main route $150, (42.)	161
8, 433	5, 199	13, 632	7, 536	251	19 3 by 6 7, f. f., m. c.; no. r. a	12	50 00	.....	162
7, 483	6, 114	13, 597	7, 520	250	b. c.; no r. a.....	12	50 00	.....	163
7, 276	4, 209	11, 485	7, 342	244	23 by 9, f. f. c., s. l	9½*	50 00	In Sept., 1872. Branch; main route $100, (64.)	164

E.—*Table showing the weight of the mails, the speed with which they*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles.	
165	Me ...	201	11	Belfast, Burnham.....	Maine Central	34. 19	20
166	Vt...	475	404	Rutland, State Line, Bennington.	Harlem Extension	59	20
167	N. Y..	1577	1267	Syracuse, Lacona	Syracuse Northern.....	42. 92	22
168	N. Y..	1509	1249	Buffalo, Emporium.....	Buffalo, New York & Philadelphia	123. 51	....
169	Wis ..	13018	.....	Menasha, Stevens' Point....	Phillips and Colby Construction Company, operating Wisconsin Central.	65. 27	20
170	N. H..	308	259	Dover, Alton Bay	Boston and Maine.....	28	25
171	Me ...	214	14	Houlton, New Brunswick Line.	New Brunswick and Canada.....	3	20
172	Kans .	14235	.....	Leavenworth, Holton	Kansas Central	55. 62	16
173	Mass .	742	659	South Framingham. Lowell.	Boston, Clinton and Fitchburgh..	29	27½
174	Vt....	520	409	Saint Albans, Richford.....	Vermont Central and Vermont and Canada.	28. 66	16. 8
175	Mo ...	10521*a*	.....	Pierce City, Carthage	Memphis, Carthage and Northwestern.	27. 31	20
176	Ala...	6615	.....	Birmingham, Meridian.....	Alabama and Chattanooga.....	153	13
177	Conn .	981	917	Litchfield, Hawleyville.....	Shepaug Valley.....	32. 25	16½
178	Ill	11432	.....	Burlington, Quincy	Chicago, Burlington and Quincy..	71. 85	22½
179	N. Y..	1008	1234	Hicksville, Northport	Long Island.....	16. 50	25
180	N. Y..	1509	1249	Buffalo, Portville.....	Buffalo and Washington	77	22
181	Mich .	12522	.....	Port Huron, Flint.....	Port Huron and Lake Michigan..	68	18¾
182	Mass .	636	627	Ayer, Lowell.....	Boston and Lowell and Nashua and Lowell.	17	25
183	N. Y..	1574	1203	Buffalo, Suspension Bridge..	Erie	25. 94	30
184	Mass .	738	657	Winchendon, Peterborough.	Monadnock	16	18
185	Ky ...	9742	.....	Glasgow Junction, Glasgow.	Louisville and Nashville and Great Southern.	12	15
186	N. Y..	1566	1269	Ithaca, Cortland Village	Ithaca and Cortland	22	20
187	Mass .	637	.....	Ayer, Mason Village.....	Fitchburgh	23	25
188	Ill	11409	.....	Elmwood, Buda	Chicago, Burlington and Quincy..	44. 50	21½
189	Ill	11405	.....	Galva, Keithsburgh	.....do	59. 30	20½
190	Conn .	972	912	Vernon Depot, Rockville....	Hartford, Providence and Fishkill Valley, lessees Rockville Railroad.	4¾	22
191	N. Y..	1005	1260	Stapleton, Tottenville.....	Staten Island	21	...
192	N. J..	2128	.....	Newark, Paterson.....	Erie	13. 12	30
193	N. Y..	1580	1265	Dunkirk, Warren.....	Dunkirk, Allegheny, and Pittsburgh, (late Dunkirk, Warren and Pittsburgh.)	55. 8	20
194	Mass .	728	652	Wakefield, Newburyport ...	Boston and Maine.....	30. 50	25
195	N. Y..	1564	1270	Port Jervis, Monticello	Monticello and Port Jervis	24	20
196	Ill	11409	.....	Rushville, Yates City.....	Chicago, Burlington and Quincy.	63. 25	20
197	Ohio ..	9036	.....	Means, Cadiz	Pittsburgh, Cincinnati and Saint Louis.	8	20
198	N. Y..	1576	1268	Rondout, Stamford.....	New York, Kingston & Syracuse.	73. 3	15
199	Mass .	617	616	Boston, Dedham	Boston and Providence	11	26
200	N. Y..	1036	1215	Buffalo, Lockport	New York Central and Hudson River.	22	....
201	N. J ..	2126	.....	Manchester, Barnegat Junction.	New Jersey Southern.....	20. 3	28
202	N. Y..	1589	1284	Cayuga, Aurora.....	Cayuga Lake	12. 25	20
203	Mass .	632	625	Somerville Junction, Lexington.	Boston and Lowell and Nashua and Lowell.	8	25
204	Mass .	733	655	Palmer, Gilbertville	New London Northern, lessees Ware River Railroad.	15. 75	20
205	N. Y..	1581	1264	Syracuse, Earlville.....	Syracuse and Chenango Valley..	41. 71	20
206	Iowa .	11018	.....	Creston, Hopkins	Burlington and Missouri River ..	44. 4	22½
207	Mass .	741	658	Palmer, Athol Depot.....	Springfield, Athol, and Northeastern, (late Athol and Enfield.)	35. 34	20
208	N. J ..	2126	.....	Eatontown, Port Monmouth.	New Jersey Southern.....	9. 8	20
209	N. Y..	1541	1277	Newburgh, Millerton	New York, Boston, and Montreal, (late Dutchess and Columbia.)	61	22

are conveyed, the accommodations for mails and agents, &c.—Continued.

Whole weight carried any distance for thirty days.			Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Outward.	Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Feet and inches.*		*Dolls.*		
4,653	5,845	10,498	7,311	243	12 by —, f. f., s. l	12	50 00		165
8,420	11,624	20,044	7,245	241	18 by 6, fixtures, s. l	7*	50 00		166
9,084	6,634	15,718	7,226	240	9 by 7, f. f., s. l	12*	50 00		167
12,163	12,378	24,541	6,881	229			50 00		168
7,059	3,012	10,071	6,687	222	7 6 by 6 10, f. f., s. l	6	50 00	In January, 1873	169
7,357	3,621	10,978	6,657	221	8 by 6, f. f., s. l	15	50 00		170
1,640	4,678	6,318	6,318	210	large cupboard, in charge of conductor.	6	50 00		171
7,829	4,303	12,132	6,284	209	7 by 7, f. f., s. l	6	50 00	In May, 1873	172
5,180	4,876	10,056	6,082	202	40 by —, f. f., d. l	12	50 00		173
5,920	3,852	9,772	6,076	202	9 6 by 7 9, f. f., s. l	6	50 00		174
4,726	2,153	6,879	6,078	202	10 by 7, f. f., s. l	7	50 00	In October, 1872	175
4,570	3,857	8,427	5,947	198	8 by 6, fixtures, s. l	6	50 00	Part; residue $50. In August, 1872.	176
4,417	5,629	10,046	5,896	196	9 3 by 6 3, f. f., s. l	12	50 00		177
6,239	5,937	12,176	5,655	189	15 by 9, f. f. c., s. l	6	50 00	In November, 1872	178
5,793	3,121	8,914	5,649	188	15 by 10, f. f., s. l	12	50 00	$425 for side service	179
8,673	7,378	16,051	5,490	183	12 by 6, f. f., s. l	6	50 00	In August, 1872	180
8,752	3,418	12,170	5,453	182	10 by 7, f. f., s. l	6	50 00	In November, 1872	181
3,876	3,616	7,492	5,424	181	8 5 by 6 8, f. f., s. l	12	50 00	$250 for m. m. service	182
4,870	783	5,653	5,453	181	b. c.; no r. a	13	50 00		183
4,343	2,745	7,088	5,286	176	no apt.; no r. a	12	50 00		184
3,898	1,360	5,258	5,258	175	b. c.; no r. a	6	50 00		185
5,156	5,154	10,310	5,185	172	12 by —, f. f., d. l	12	50 00		186
4,638	3,019	7,657	4,646	172	6 5 by 3, f. f., s. l	12	50 00	In July, 1872. 27 days.	187
3,041	5,739	8,780	5,110	170	22 3 by 8 9, f. f. c., m. c., s. l	6	50 00	In Nov., 1872. Branch; main route $50, (196.)	188
6,877	2,996	9,873	5,050	168	15 by 8 9, f. f. c., s. l	6	50 00	In Nov., 1872. Branch; main route $200, (22.)	189
3,638	1,872	5,510	5,055	168	b. c.; no r. a	18	50 00		190
.....	.....	.....	.....	168		12	50 00		191
3,868	2,845	6,713	4,984	166	b. c.; no r. a	6	50 00		192
5,987	5,537	11,524	4,947	165	10 by 7, s. l	6	50 00		193
6,789	4,537	11,326	4,854	161	b. c.; no r. a	6	50 00		194
3,520	2,645	6,165	4,814	160	in charge of conductor	8*	50 00		195
4,921	10,691	15,612	4,682	156	22 3 by 8 9, f. f. c., and m. c., s. l.	9*	50 00	In Nov., 1872. Main route; br'ch $50, (188.)	196
3,129	1,574	4,703	4,703	156	no r. a	18	50 00	Branch; main route $200, (19.) In March, 1872.	197
8,581	4,836	13,417	4,578	152	12 by —, f. f., s. l	6	50 00		198
3,233	2,374	5,607	4,479	149	no apt.; no r. a	12	50 00		199
3,027	2,203	5,230	4,445	148			50 00	In September, 1872	200
3,793	2,825	6,618	3,515	140	8 by 6, f. f., s. l	12	50 00	25 days. In August, 1872. Branch; main route $50, (136.)	201
3,610	2,065	5,675	4,186	139	10 by 9 6, f. f., s. l	6	50 00		202
3,208	1,911	5,119	4,153	138	36 cubic feet; no r. a	12	50 00		203
2,996	2,138	5,134	4,084	136	no apt.; no r. a	6	50 00		204
7,098	4,215	11,313	3,702	123	8 by 8, f. f., s. l	9*	50 00		205
3,913	1,654	5,567	3,672	122	23 by 9, f. f. c., s. l	6	50 00	In September, 1872	206
4,344	2,927	7,271	3,682	122	9 by 7, f. f., s. l	7*	50 00		207
3,558	2,162	5,720	3,037	121	b. c.; no r. a	8*	50 00	25 days. In August, 1872. Branch; main route $50, (136.)	208
10,383	6,542	16,925	3,581	119	10 by 6, f. f., s. l	6	50 00		209

E.—*Table showing the weight of the mails, the speed with which they*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles.	
210	Ill	11901	.....	Streator, Aurora	Chicago, Burlington, and Quincy.	60. 79	20
211	N. Y..	1510	1246	Schoharie, Middleburgh	Middleburgh and Schoharie.....	5. 50	12. 7
212	Conn .	945	910	Bethel, Hawleyville	Danbury and Norwalk.....	6. 01	20
213	Md ...	3517	.....	Berlin, Snow Hill	Worcester	14	20
214	Mass .	631	624	Winchester, Woburn	Boston and Lowell and Nashua and Lowell.	3	25
215	Vt	475	.....	Rutland, State-line, Bennington.	Harlem Extension.....	59	20
216	Iowa .	11020*a*	.....	Beulah, Elkader	Iowa Eastern	17. 75	10
217	N. Y..	1009	1202	Sufferns, Piermont.....	Erie	18	28
218	N. Y..	1587	1262	East Gainesville, Perry	Rochester and Pine Creek	6. 55	20
219	Conn .	980	916	Hartford, Millerton	Connecticut Western	69. 18	20
220	N. Y..	1562	1272	Canastota, Cazenovia.....	Cazenovia and Canastota	15	20
221	Mass .	610	610	Boston, Medford	Boston and Maine.....	5. 50	25
222	N. Y..	1030	1214	Canandaigua, Niagara Falls	New York Central and Hudson River.	97	....
223	N. Y..	1011	1261	Hudson, West Stockbridge .	Hudson and Boston.....	35	25
224	Pa....	1875	2466	Wellsborough, Antrim.....	Fall Brook Coal Company.....	13. 6	16½
225	Md ...	3511	.....	Townsend, Centerville	Queen Anne's and Kent.....	36	25
226	Mass .	635	626	South Acton Depot, Hudson.	Fitchburgh	9	25
227	Mass .	650	633	Canton Depot, Stoughton ...	Stoughton Branch Boston and Providence.	4	26
228	Mass .	616	615	Boston, West Lynn Depot ..	Eastern, of Massachusetts	10	18
229	Mass	746	661	Holyoke, Westfield	New Haven and Northampton...	10. 53	28
230	Mass .	629	623	Lowell, Lawrence	Boston and Lowell and Nashua and Lowell.	14	25
231	Mass .	635	.....	South Acton, Hudson	Fitchburgh	9	25
232	Pa....	2467	.....	Phœnixville, Eagle	Philadelphia and Reading	11. 12	12
233	N. Y..	1007	1232	Mineola, Locust Valley	Long Island	12. 25	25
234	Mass .	727	651	Gloucester, Pigeon Cove	Eastern, of Massachusetts	6. 50	24
235	N. J ..	2127	.....	Whitings, Atco	New Jersey Southern.....	33. 3	17
236	Mass .	676	640	Taunton, Middleborough....	Middleborough and Taunton	9. 50	25
237	Ill	11900	.....	McLeansboro', Shawneetown	Evansville, Henderson and Nashville.	41. 25	23
238	Mass .	748	662	Milford, Bellingham	Providence and Worcester.....	5	....
239	Ill	11901	.....	Aurora, Batavia	Chicago, Burlington and Quincy.	9	20
240	Pa....	1820	2420	Blossburgh, Morris Run	Tioga.....	3. 80	16
241	Mass	618	617	Grafton Depot, Millbury....	Boston and Albany	4	25
242	N. Y..	1579	1266	Ithaca, State Line	Ithaca and Athens.....	34. 6	30
243	Mass .	621	620	Salem, Lawrence.....	Eastern, of Massachusetts	20	20
244	Ill	11405	.....	Aurora, Turner	Chicago, Burlington and Quincy.	13	14
245	Mass .	639	630	Natick, Saxonville	Boston and Albany	4	25
246	Pa....	2463	.....	Topton, Kutztown	Philadelphia and Reading.....	4. 36	18
247	Pa....	1820	2420	Blossburgh, Arnot	Tioga.....	3. 79	16
248	Mass .	638	629	Auburndale Station, Newton Lower Falls.	Boston and Albany	2	25
249	Ala...	6619	.....	Chehaw, Tuskegee.....	Tuskegee	6	10
250	Pa....	2465	.....	Carbondale, Susquehanna Depot.	Erie	38. 25	27
251	Md ...	3516	.....	Junction, Newtown.....	Worcester and Somerset.....	9	20
252	N. J ..	2120	.....	New Bridge, Nanuet Junction.	Erie	13. 25	30
253	Mass .	622	621	Georgetown, Haverhill.....	Boston and Maine	6. 50	25
254	Pa ...	2477	.....	Conshohocken, Flourtown ..	Philadelphia and Reading	7. 25	9
255	N. Y..	1518	1280	Plattsburgh, Ausable Forks.	New York & Canada, (late Whitehall and Plattsburgh.)	23	24
256	N. Y..	1560	1274	Johnsonville, Greenwich....	Greenwich and Johnsonville.....	14	25

are conveyed, the accommodations for mails and agents, &c.—Continued.

Whole weight carried any distance for thirty days.			Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Outward.	Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Feet and inches.*		*Dolls.*		
4,430	6,319	10,749	3,550	118	20 by 8 6, f. f., s. l	9*	50 00	In November, 1872. Main route; branch $50, (239.)	210
2,536	1,011	3,547	3,547	118	9 by 8 6; no r. a	12	50 00		211
3,067	435	3,502	3,502	116	No apt.; no r. a	12	50 00	Branch; main route $85.11, (83.)	212
2,313	1,314	3,627	3,468	115	9 2 by 4 2, f. f., s. l	6	50 00	In February, 1873	213
2,229	1,210	3,439	3,439	114	36 cubic feet; no r. a	12	50 00		214
6,966	7,158	14,124	3,403	113	18 by 6, fixtures, s. l	7*	50 00	In September, 1872	215
2,296	1,434	3,730	3,313	110	20 by 7, f. f., s. l	6	50 00	In May, 1873	216
2,969	2,109	5,078	3,300	110	b. c.; no r. a	6	50 00		217
1,969	1,272	3,241	3,241	108	b. c.; no r. a	12	50 00		218
8,425	7,716	16,141	3,203	106	12 by 6 6, f. f., d. l., 11½ m., s. l. residue.	7⅝*	50 00		219
1,548	2,284	3,832	3,196	106	apt. in b. c.; no r. a	18	50 00		220
1,880	1,257	3,137	3,137	104	b. c.; no r. a	12	50 00		221
8,293	6,703	14,996	3,100	103			50 00	In September, 1872	222
4,429	2,371	6,800	3,019	100	b. c.; no r. a	12	50 00		223
2,164	1,257	3,421	2,885	96	7 by 11, f. f. c., s. l	6	50 00	In January, 1873. Part; residue $50, (141.)	224
3,358	2,342	5,700	2,764	92	15 by 10, f. f., s. l	6	50 00	In January, 1873	225
2,459	1,390	3,849	2,701	90	no apt.; no r. a	12	50 00	$50 for m. m. service	226
722	1,990	2,712	2,712	90	no apt.; no r. a	12	50 00		227
1,927	1,406	3,333	2,704	90	b. c.; no r. a	12	50 00		228
1,527	1,130	2,657	2,657	88	no apt.; no r. a	12	50 00		229
1,766	1,345	3,111	2,627	87	36 cubic feet.; no r. a	12	50 00	$350 for m. m. service	230
1,884	1,118	3,002	2,253	83	no apt	12	50 00	$50 for m. m. service. In July, 1872. 27 days.	231
2,196	1,358	3,554	2,372	79	b. c	6	50 00	In October, 1872	232
2,021	1,756	3,777	2,325	77	15 by 10, f. f., s. l	12	50 00	$250 per annum additional for side service	233
2,276	1,371	3,647	2,246	75	b. c.; no r. a.	14	50 00	$125 for m. m. service	234
2,039	1,562	3,601	1,786	71	8 by 6, f. f., s. l	6	50 00	25 days. In Aug., 1872	235
1,616	1,038	2,654	2,066	69	b. c.; no r. a	18	50 00		236
1,970	2,267	4,237	2,033	68	12 by 9, f. f., s. l	9*	50 00	In Dec., 1872. Branch; main route $50, (132.)	237
.....	.....	.....	1,800	60	no apt.; no r. a	12	50 00		238
1,033	678	1,711	1,711	57	b. c.; no r. a	12	50 00	In November, 1872. Branch; main route $50, (210.)	239
1,080	630	1,710	1,710	57	no r. a	6	50 00	Branch; main route $75, (106.) In January, 1873.	240
1,067	636	1,703	1,703	56	b. c.; no r. a	12	50 00		241
2,987	3,067	6,054	1,636	54	12 by 7, f. f., s. l	6	50 00		242
3,736	2,668	6,404	1,526	51	b. c.; no r. a	9*	50 00		243
1,311	1,232	2,543	1,554	51	b. c.; no r. a	6	50 00	In November, 1872. Branch; main route $200, (22.)	244
987	543	1,530	1,530	51	b. c.; no r. a	12	50 00		245
811	685	1,496	1,496	50	b. c	9	50 00		246
930	570	1,500	1,500	50	no r. a	6	50 00	Branch; main route $75, (106.) In January, 1873.	247
812	573	1,385	1,385	46	b. c.; no r. a	12	50 00		248
383	925	1,308	1,308	43	no apt. or r. a	12	50 00		249
1,874	2,334	4,208	1,281	42	9 by 8, f. f. c., s. l	6	50 00		250
710	490	1,200	1,200	40	Passenger-car	6	50 00	In December, 1872	251
1,530	1,253	2,783	1,074	35	b. c.; no r. a	6	50 00		252
475	267	742	742	24	b. c.; no r. a	6	50 00		253
686	312	998	632	21	b. c.; no r. a	6	50 00		254
4,091	1,611	5,702	3,744	125	no apt.; no r. a	6	43 47	Returns not certified	255
1,826	1,472	3,298	2,596	86	apt. in b. c., furniture	12	42 85		256

E.—*Table showing the weight of the mails, the speed with which they*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles.	
257	Ky ...	9738	.....	Elizabethtown, Paducah	Elizabethtown and Paducah.....	185	18
258	Ind ...	12001	.....	Indianapolis, Vincennes	Indianapolis and Vincennes.....	116.32	25
259	Ill	11900	.....	McLeansboro', Shawneetown	Saint Louis and Southeastern....	41.25	23
260	Ill	11902	.....	Mendota, Clinton	Chicago, Burlington and Quincy.	64.19	21½
261	Pa....	2461	.....	Towanda, Bernice	Sullivan & Erie Coal & Railroad.	29.32	14
262	Pa....	2424	.....	Alton, Carrollton	Erie	25.5	25
263	Ind ...	12030	.....	Attica, Veedersburgh	Mathers, Chamberlain & Co., lessees Indiana North and South Railway.	14	15
264	N. Y..	1045	1209	Goshen, Montgomery	Erie	10.25	27
265	S. C...	5608	.....	Florence, Cheraw	Cheraw and Darlington.....	40	13½
266	Iowa .	11003*a*	.....	Chariton, Leon.....	Burlington and Missouri River ..	37.44	12
267	Miss..	7008	.....	Middleton, Ripley	Ripley	24.75	15
268	N. J ..	2129	... ..	Atsion, Greenwich.....	Vineland	44.25	25
269	Ohio ..	9044	.....	Marietta, Cambridge.....	Marietta and Pittsburgh.....	60.11	20
270	Ill	11918	.....	Paris, Danville.....	Paris and Danville.....	36	15
271	Conn .	945	910	Branchville, Ridgefield	Danbury and Norwalk.....	4	20
272	N. Y..	1543	1275	Montgomery, Kingston	Wallkill Valley.....	33.46	25

are conveyed, the accommodations for mails and agents, &c.—Continued.

Whole weight carried any distance for thirty days.			Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Outward.	Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Feet and inches.*		*Dolls.*		
39,008	18,720	57,728	21,016	700	13 by 8, f. f., s. l	6	40 00	In October, 1872	257
11,032	6,233	17,265	6,440	214	20 by 8 4, f. f., s. l	12	40 00	In October, 1871	258
.....	.....	.....	3,346	111	10 by 8, f. f., s. l	12	40 00	Branch; main route $90, (78.)	259
4,121	2,131	6,252	1,955	65	10 by 7, f. f., s. l	6	40 00	In November, 1872	260
3,350	1,940	5,290	1,847	62	9 by 6, fixtures, s. l	6	40 00	In July, 1873	261
1,557	1,180	2,737	1,555	51	b. c.; no r. a	6	40 00	.....	262
916	900	1,816	1,002	33	12 by 9, fixtures. Mails in charge of sworn employé of company.	6	40 00	In May, 1873	263
3,991	1,782	5,773	5,541	184	7 by 6, f. f. c., s. l	6	39 02	.....	264
1,762	7,621	9,383	6,053	201	13 by 9, f. f. c., s. l	6	30 00	.....	265
2,648	1,344	3,992	3,073	102	23 by 9, f. f. c., s. l	6	30 00	In September, 1872	266
2,187	1,330	3,517	2,601	86	b. c.; no r. a	6	30 00	In April, 1873	267
2,626	2,276	4,902	2,009	80	8 by 6, f. f., s. l	6	30 00	25 days. In Aug., 1872	268
3,653	2,963	6,616	1,793	59	10 by 7 6, f. f., s. l	6	30 00	In September, 1872	269
1,367	1,953	3,320	1,764	58	6 by 3, f. f., s. l	6	30 00	In November, 1872	270
1,175	510	1,685	1,685	56	no apt.; no r. a	12	30 00	Branch; main route $85.11, (83.)	271
3,615	2,457	6,072	1,507	50	7 by 5 2, fixtures, s. l	6	30 00	.....	272

JOHN L. ROUTT,
Second Assistant Postmaster-General.

Index to Table E.

Title.	Order.	Number of route.	New number of route.
Alabama and Chattanooga	176	6615	.....
Androscoggin. (See Maine Central)			
Atchison and Nebraska	155	14212	.....
Athol and Enfield. (See Springfield, Athol and Northeastern.)			
Baltimore and Ohio	17	3504	.....
Bangor and Piscataquis	157	188	10
Boston and Albany	1	605	.....
Do	4	605	.....
Do	9	605	.....
Do	153	641	632
Do	241	618	617
Do	245	639	630
Do	248	638	629
Boston and Lowell and Nashua and Lowell	35	603	.....
Do	125	278	257
Do	182	636	627
Do	203	632	625
Do	214	631	624
Do	230	629	623
Boston and Maine	42	602	.....
Do	161	602	.....
Do	170	308	259
Do	194	728	652
Do	221	610	.....
Do	253	622	621
Boston and Providence	25	608	.....
Do	199	617	616
Boston, Barre and Gardner	133	745	660
Boston, Clinton and Fitchburgh	96	688	644
Do	97	640	631
Do	146	735	656
Do	173	742	659
Boston, Concord and Montreal	72	253	252
Do	140	331	261
Buffalo and Washington	180	1509	1249
Buffalo, Corry and Pittsburgh	154	1043	1252
Buffalo, New York and Philadelphia	168	1509	1249
Burlington and Missouri River	64	11003	.....
Do	164	11003	.....
Do	206	11018	.....
Do	266	11003*a*	.....
Burlington, Cedar Rapids and Minnesota	128	11012	.....
Cayuga Lake	202	1589	1284
Cazenovia and Canastota	220	1562	1272
Central, of New Jersey	20	1605	2101
Champlain and Saint Lawrence	53	1023	1258
Cheraw and Darlington	265	5608	.....
Cheshire and Ashuelot	52	689	645
Do	152	703	649
Chicago, Burlington and Quincy	22	11405	.....
Do	39	11417	.....
Do	98	11002	.....
Do	144	11415	.....
Do	178	11432	.....
Do	188	11409	.....
Do	189	11405	.....
Do	196	11409	.....
Do	210	11901	.....
Do	239	11901	.....
Do	244	11405	.....
Do	260	11902	.....
Cincinnati and Muskingum Valley	104	9033	.....
Cincinnati, La Fayette and Chicago	40	12028	.....
Cleveland, Columbus, Cincinnati and Indianapolis	12	9046	.....
Do	13	9018	.....
Do	49	9015	.....
Columbus and Xenia	11	9016	.....
Columbus, Chicago and Indiana Central	24	9017	.....
Connecticut and Passumpsic Rivers	62	452	402
Connecticut River	36	702	648
Connecticut Western	219	980	916
Consolidated European and North American	47	181	9
Cooperstown and Susquehanna Valley	119	1525	1278
Dakota Southern	102	13929	.....
Danbury and Norwalk	83	945	910
Do	212	945	910
Do	271	945	910
Delaware, Lackawanna and Western	82	1040	1230
Do	137	1228	1229
Do	151	1405	1228
Do	162	1545	1231
Dunkirk, Allegheny Valley and Pittsburgh, (late Dunkirk, Warren and Pittsburgh)	193	1580	1265
Dunkirk, Warren and Pittsburgh. (See Dunkirk, Allegheny Valley and Pittsburgh.)			
Dutchess and Columbia. (See New York, Boston and Montreal.)			
Eastern, of Massachusetts	21	601	.....
Do	28	114	124
Do	120	732	654
Do	138	620	619
Do	145	619	618
Do	228	616	615
Do	234	727	651
Do	243	621	620
Elizabethtown and Paducah	257	9738	.....
Erie	3	1035	1207
		1038	1208
Do	8	1001	1201
Do	14	1035	1207
Do	15	1038	1208
Do	59	1035	1207
Do	60	1035	1207
Do	100	1032	1205
Do	109	2409	.....
Do	124	1033	1206
Do	163	1010	1204
Do	183	1574	1203
Do	192	2128	.....
Do	217	1009	1202
Do	250	2465	.....
Do	252	2120	.....
Do	262	2424	.....
Do	264	1045	1209
Erie and Pittsburgh	99	1850	2445
European and North American. (See Consolidated European and North American.)			
Evansville and Crawfordsville	84*a*	12012	.....
Evansville, Henderson and Nashville	132	11900	.....
Do	237	11900	.....
Fall Brook Coal Company	141	1875	2466
Do	224	1875	2466
Fall River, Warren and Providence	158	821	804
Fitchburgh	29	604	.....
Do	34	604	.....
Do	147	637	628
Do	187	637	.....
Do	226	635	626
Do	231	635	.....
Fonda, Johnstown and Gloversville	116	1561	1273
Grand Trunk, of Canada	46	116	6
Do	65	116	6
Great Western, of Canada	130	1034	1254
Greenwich and Johnsonville	256	1560	1274
Harlem Extension	156	1524	1279
Do	160	1524	1279

Index to Table E—Continued.

Title.	Order.	Number of route.	New number of route.
Harlem Extension	166	475	404
Do	215	475	.....
Hartford, Providence and Fishkill	75	955	911
Hartford, Providence and Fishkill, lessees Rockville Railroad	190	972	912
Housatonic	87	943	909
Houston and Texas Central, operating Waco and Northwestern Railway	142	8577*a*	.....
Hudson and Boston	223	1011	1261
Indiana North and South. (See Mathers, Chamberlain & Co., lessees.)			
Indianapolis and Vincennes	258	12001	.....
Indianapolis, Bloomington and Western	80	12017	.....
Iowa Eastern	216	11020*a*	.....
Ithaca and Athens	242	1579	1266
Ithaca and Cortland	186	1566	1269
Kansas Central	172	14235	.....
Knox and Lincoln	85	204	.....
Lewy's Island. See St. Croix and Penobscot.			
Long Island	74	1006	1233
Do	179	1008	1234
Do	233	1007	1232
Louisville and Nashville and Great Southern	185	9742	.....
Maine Central	45	9	2
Do	57	115	5
Do	58	115	5
Do	123	9*a*	3
Do	165	201	11
Maine Central, (late Androscoggin)	94	19	34
Maine Central, (late Portland and Kennebec)	105	1	.....
Marietta and Pittsburgh	269	9044	.....
Mathers, Chamberlain & Co., lessees Indiana North and South Railway	263	12030	.....
Memphis, Carthage and Northwestern	175	10521*a*	.....
Middleborough and Taunton	236	676	640
Middleburgh and Schoharie	211	1510	1246
Mobile and Montgomery	63	6612	.....
Monadnock	184	738	657
Monticello and Port Jervis	195	1564	1270
Montreal and Plattsburgh. (See New York and Canada.)			
Naugatuck	84	942	908
Do	114	942	908
New Bedford and Taunton	86	678	.....
Do	129	672	.....
New Brunswick and Canada	171	214	14
Newcastle and Beaver Valley. (See Pittsburgh, Fort Wayne and Chicago.)			
New Haven and Derby	159	977	915
New Haven and Northampton	90	938	906
Do	113	938	906
Do	229	746	661
New Haven, Middletown and Willimantic	150	975	913
New Jersey Southern	136	2126	.....
Do	201	2126	.....
Do	208	2126	.....
Do	235	2127	.....
New London Northern, lessees Ware River Railroad	204	733	655
New London Northern. (See Vermont Central.)			
New York and Canada, (late Montreal and Plattsburgh)	103	1021	1243
New York and Canada, (late Whitehall and Plattsburgh)	255	1518	1280
New York, Boston and Montreal, (late Dutchess and Columbia)	209	1541	1277
New York Central and Hudson River	5	1002	1211
Do	7	1079	1217
Do	10	1282	1218
Do	67	1027	1213
Do	108	1016	1212
Do	111	1037	1216
Do	200	1036	1215
Do	222	1030	1214
New York, Kingston and Syracuse	198	1576	1268
New York, New Haven and Hartford	6	937	905
Do	37	936	904
Do	110	932	903
New York, Providence and Boston	48	802	.....
Northern Central	41	1031	1255
Norwich and Worcester	101	925	901
Ogdensburgh and Lake Champlain	79	1022	1242
Oswego and Syracuse	95	1029	1256
Paris and Danville	270	11918	.....
Philadelphia and Reading	18	1605	2101
Do	232	2467	.....
Do	246	2463	.....
Do	254	2477	.....
Phillips & Colby Construction Company, operating Wisconsin Central	169	13018	.....
Pittsburgh, Cincinnati and Saint Louis	19	9036	.....
Do	32	9012	.....
Do	33	9034	.....
Do	122	1864	2456
Do	197	9036	.....
Pittsburgh, Fort Wayne and Chicago	16	9002	.....
Pittsburgh, Fort Wayne and Chicago, lessees Newcastle and Beaver Valley	112	1849	2429
Pittsfield and North Adams	121	721	650
Port Huron and Lake Michigan	181	12522	.....
Portland and Kennebec. (See Maine Central.)			
Portland and Ogdensburgh	131	521	410
Portland and Rochester	126	117	7
Portland, Saco and Portsmouth. (See Eastern, of Massachusetts.)			
Providence and Worcester	93	801	.....
Do	238	748	662
Providence, Warren and Bristol	127	803	.....
Queen Anne's and Kent	225	3511	.....
Quincy, Alton and Saint Louis	88	11431	.....
Ripley	267	7008	.....
Rochester and Pine Creek	218	1587	1262
Rockville. (See Hartford, Providence and Fishkill.)			
Rome, Watertown and Ogdensburgh	54	1026	1227
Do	55	1026	1227
Do	139	1042	1225
Do	149	1024	1226
Rutland and Burlington	26	482	406
Do	27	482	406
Do	66	482	406
Saint Croix and Penobscot, (late Lewy's Island)	76	84	4
Saint Louis and Southeastern	77	10008	.....
Do	78	11900	.....
Do	92	9612*a*	.....
Do	259	11900	.....
Schoharie Valley	89	1014	1247
Shepaug Valley	177	981	917
Skaneateles	118	1046	1251
South and North Alabama	70	6604	.....

Index to Table E—Continued.

Title.	Order.	Number of route.	New number of route.
South and North Alabama	107	6604	.....
Southern Railroad Association, lessees Mississippi Central	23	7001	.....
South Side	143	1044	1282
Springfield and Illinois Southeastern	135	11433	.....
Springfield, Athol and Northeastern, (late Athol and Enfield)	207	741	658
Staten Island	191	1005	1260
Stoughton Branch Boston and Providence	227	650	633
Sullivan	44	481	405
Sullivan and Erie Coal and Railroad	261	2461	.....
Syracuse and Chenango Valley	205	1581	1264
Syracuse, Binghamton and New York	81	1028	1257
Syracuse Northern	167	1577	1267
Taunton Branch	51	677	641
Tioga	106	1820	2420
Do	115	1820	2420
Do	240	1820	2420
Do	247	1820	2420
Troy and Boston	50	1017	1259
Tuskegee	249	6619	.....
Utica and Black River	117	{1025} {1181}	1283
Vermont and Massachusetts	61	690	646
Vermont Central	31	461	403
Vermont Central and Vermont and Canada	30	412	401
Do	73	508	408
Do	134	1582	1263
Do	174	520	409
Vermont Central, operating New London Northern	68	926	902
Do	91	696	647
Vermont Valley	43	487	407
Vineland	268	2129	.....
Waco and Northwestern. (See Houston and Texas Central.)			
Wallkill Valley	272	1543	1275
Ware River. (See New London Northern.)			
Western Maryland	148	3507	.....
Whitehall and Plattsburgh. (See New York and Canada.)			
Wilmington, Columbia and Augusta	38	5604	.....
Do	71	5604	.....
Wisconsin Central. (See Phillips and Colby Construction Companys.)			
Worcester	213	3517	.....
Worcester and Nashua	69	683	643
Worcester and Somerset	251	3516	.....

Index to Table F.

Title.	Order.	No. of route.	New number of route.
Alabama and Chattanooga	54	6615	.....
Atchison and Nebraska	48	14212	.....
Baltimore and Ohio	11	2904	3504
Burlington and Missouri River	19	11003	.....
Do	61	11003*a*	.....
Central, of New Jersey	9	1605	2101
Chicago, Burlington and Quincy	13	11405	.....
Do	22	11417	.....
Do	36	11002	.....
Do	45	11415	.....
Cincinnati, LaFayette and Chicago	24	12028	.....
Cleveland, Columbus, Cincinnati and Indianapolis	14	9046	.....
Do	15	{9015} {9018}	.....
Do	18	9018	9018
Do	25	9015	.....
Columbus and Xenia	5	9016	9016
Connecticut River	23	706	702
Dakota Southern	41	13929	.....
Elizabethtown and Paducah	33	9738	.....
Erie	3	1001	.....
Do	4	{1035} {1038}	.....
Do	7	1035	.....
Erie and Pittsburgh	37	1850	2445
Fall Brook Coal Company	42	1875	2466
Do	62	1875	2466
Fitchburgh	20	604	.....
Harlem Extension	49	1524	.....
Houston and Texas Central, operating Waco and Northwestern Railway	44	8577*a*	.....
Indiana, North and South, (See Mathers, Chamberlain & Co., lessees)			
Indianapolis and Vincennes	52	12001	.....
Indianapolis, Bloomington and Western	32	12017	.....
Iowa Eastern	60	11020*a*	.....
Knox and Lincoln	35	204	.....
Lehigh Valley	10	1605	2479
Louisville and Nashville and Great Southern	56	9742	.....
Marietta and Pittsburgh	72	9044	.....
Mathers, Chamberlain & Co., lessees Indiana North and South Railroad	73	12030	.....
Memphis, Carthage and Northwestern	53	10521*a*	.....
Mobile and Montgomery	21	6612	.....
New Jersey Southern	40	1608	2126
New York Central and Hudson River	1	1002	.....
Do	2	1079	.....
Do	26	1027	.....
Petersburgh	17	4410	.....
Philadelphia and Reading	8	1605	2476
Do	46	1814	2414
Do	63	2467	.....
Do	65	2463	.....
Phillips and Colby Construction Company, operating Wisconsin Central Railroad	51	13018	.....
Pittsburgh, Cincinnati and Saint Louis	12	9036	9036
Do	34	9012	9012
Do	47	9034	9034
Pittsburgh, Fort Wayne and Chicago	6	9002	9002
Pittsburgh, Fort Wayne and Chicago, (lessees)	57	1849	2429
Port Huron and Lake Michigan	55	12522	.....
Quincy, Alton and Saint Louis	38	11431	.....
Richmond and Petersburgh	16	4409	.....
Ripley	68	7008	.....
Rockford, Rock Island and Saint Louis	31	11429	.....
Saint Joseph and Denver City	50	14004	.....
Saint Louis and Southeastern	27	10008	.....
Do	28	9612*a*	.....
Do	29	11900	.....
Do	30	11900	.....
Do	59	11900	.....
Do	70	11900	.....
Springfield and Illinois Southeastern	39	11433	.....
Sullivan and Erie Coal Railroad	71	1869	2461
Tioga	64	1820	2420
Tuskegee	66	6619	.....
Vineland	69	1746	2129
Waco and Northwestern. (See Houston and Texas Central.)			
Western Maryland	43	3507	.....
Wisconsin Central. (See Phillips and Colby Construction Company.)			
Worcester	58	3517	.....
Worcester and Somerset	67	3516	.....

F.—*Table showing the re-adjustment of the rates of pay per mile on certain railroad routes mails, the speed with which they are conveyed, the accommodations*

[ABBREVIATIONS.—f. f., fixtures and furniture; f. f. c., fixtures and furniture complete; m. c., mail-line; r a., route agent. A number followed by an asterisk (*) shows the equivalent in round trips, a "Remarks" column refer to the order of the routes in this table.]

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.
						Miles.	*Pounds.*	
1	N. Y ..	1002	.....	New York, Troy.....	New York Central and Hudson River.	150	31, 399	....
2	N. Y ..	1079	.....	Albany, Buffalo.....	New York Central and Hudson River.	298	31, 399	...
3	N. Y ..	1001	.....	New York, Dunkirk..	Erie	460	31, 273	33
4	N. Y ..	1035, 1038	.....	Buffalo, Hornellsville.	.....do	91	20, 717	32
5	Ohio ..	9016	9016	Columbus, Zenia.....	Columbus and Xenia.....	55	16, 119	27
6	Ohio ..	9002	9002	Pittsburgh, Chicago ..	Pittsburgh, Fort Wayne and Chicago.	469. 50	13, 710	30
7	N. Y ..	1035	.....	Attica, Corning.....	Erie	111	12, 124	30
8	Pa	1605	2476	Allentown, Harrisburgh.	Philadelphia and Reading..	90	11, 859	26
9	N. J...	1605	2101	Jersey City, Easton...	Central, of New Jersey....	74	11, 357	25
10	Pa	1605	2479	Easton, Allentown....	Lehigh Valley	16. 58	.....	25
11	Md ...	2904	3504	Baltimore, Wheeling..	Baltimore and Ohio	377	12, 579	24
12	Ohio ..	9036	9036	Columbus, Pittsburgh.	Pittsburgh, Cincinnati and Saint Louis.	160	11, 430	30
13	Ill	11405	.....	Chicago, Burlington ..	Chicago, Burlington and Quincy.	207. 70	7, 313	24½
14	Ohio ..	9046	.....	Cleveland, Cincinnati.	Cleveland, Columbus, Cincinnati and Indianapolis.	254. 25	6, 220	28
15	Ohio ..	9015, 9018	.....	Cleveland, Indianapolis.	Cleveland, Columbus, Cincinnati and Indianapolis.	284	5, 205	30
16	Va	4409	.....	Richmond, Petersburgh.	Richmond and Petersburgh	24. 50	3, 959	25
17	Va	4410	.....	Petersburgh, Weldon.	Petersburgh	65. 51	3, 824	23
18	Ohio ..	9018	9018	Galion, Indianapolis ..	Cleveland, Columbus, Cincinnati and Indianapolis.	204	3, 444	28
19	Iowa ..	11003	.....	Burlington, East Plattsmouth.	Burlington and Missouri River.	279. 14	2, 598	21
20	Mass ..	604	.....	Boston, Fitchburgh...	Fitchburgh	52	2, 357	30

and on certain new routes the adjustment of the rates, based upon returns of the weight of the provided for mails and agents, and the number of trips per week.

catchers; r. p. o., railway post-office; apt., apartment; b. c., baggage-car; d. l., double line; s. l., single more particular statement in tabular form being inconvenient. The figures in parentheses in the

Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of re-adjustment or adjustment.	Remarks.	Order.
Feet and inches.		*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*			
.....	.....	375 00	350 00	56, 250 00	52, 500 00	July 1, 1872	Ordered June, 1873...	1
.....	.....	375 00	300 00	111, 750 00	89, 400 00	July 1, 1872	Ordered June, 1873...	2
r. p. o., 50 by 10, f. f. c., d. l.; r. a. apts., 42 by 11, 26 by 11, 16 by 11, f. f. c.	20½*	375 00	300 00	172, 500 00	138, 000 00	Oct. 1, 1872	.....	3
r. p. o., 42 by 11, 26 by 11, 16 by 11, f. f. c., s. l.	20½*	375 00	200 00	34, 125 00	18, 200 00	Oct. 1, 1872	Part of 1035; residue $300, (7.)	4
20 by 8 4, f. f., s. l.	25	325 00	225 00	17, 875 00	12, 375 00	July 1, 1872	Ordered Jan., 1873...	5
20 by 8 4, f. f., d. l.	26	300 00	200 00	140, 850 00	93, 900 00	July 1, 1872	Ordered Jan., 1873...	6
r. p. o., 42 by 11, 26 by 11, 16 by 11, f. f. c., s. l.	22½	300 00	100 00	33, 300 00	11, 100 00	Oct. 1, 1872	Part; residue $375, (4.)	7
14 by 9, 11 by 8 6, f.f., s. l. Through mails in through cars between New York and Harrisburgh.	19¾*	300 00	200 00	27, 000 00	18, 000 00	July 1, 1872	Part of New Jersey route 1605, old; company to provide enlarged and improved accommodations, when required, for mails and agents, and continue, in conjunction with connecting roads, to carry through mails in through cars between New York and Harrisburgh. Ordered Jan., 1873.	8
12 by 9, d. l. Trough mails in through cars between N. York & Harrisburgh.	19	300 00	200 00	22, 200 00	14, 800 00	July 1, 1872	Conditions as on 2476, (8.) Ordered Nov., 1872.	9
Commodious apts., f. f., 2½ lines.	35	300 00	200 00	4, 974 00	3, 316 00	July 1, 1872	Part of New Jersey route 1605, old. Conditions as on 2476, (8.) Ordered March, 1873.	10
16 8 by 8, f. f., s. l.	18	285 00	247 10	107, 445 00	93, 900 00	July 1, 1872	Ordered June, 1873. 3 miles decrease. Weight in March and April, 1873.	11
20 by 8 4, f. f., s. l.	12	275 00	200 00	44, 000 00	32, 000 00	July 1, 1872	Ordered Jan., 1873. 33 miles to Newark, covered by route 9001.	12
r. p. o., 36 by 9, f. f. c., s. l.	20½*	225 00	200 00	46, 732 50	41, 540 00	Oct. 1, 1872	.....	13
r. p. o., 39 2 by 9 2, f. f. c., s. l.	12	225 00	.....	.....	.....	Sept. 1, 1872	New. Ordered June, 1873.	14
r. p. o., 39 2 by 9 1, s. l.	14*	215 00	175 00	61, 060 00	49, 700 00	Jan. 1, 1872	Ordered Dec., 1872...	15
r. p. o., 42 by 8 9, f. f. c., d. l.	13	200 00	175 00	4, 900 00	4, 287 50	Feb. 27, 1872	Ordered Dec., 1872 ..	16
r. p. o., 42 by 8 9, f. f. c., d. l.	13	200 00	175 00	13, 102 00	11, 375 00	Feb. 27, 1872	Ordered Dec., 1872, .51 mile increase.	17
r. p. o., 39 2 by 9 2, f. f. c., s. l.	12	200 00	215 00	40, 800 00	43, 860 00	July 1, 1872	Ordered June, 1873...	18
r. p. o., 23 by 9, f. f. c., s. l.	12	175 00	100 00	48, 849 50	27, 914 00	July 1, 1872	Ordered Oct., 1872....	19
r. p. o., 25 by 7, 24 by 6 6., s. l.; r. a. apt., 15 by 7 6, 11 by 6 6, f. f., s. l.	18	175 00	153 84	9, 100 00	8, 000 00	July 1, 1872	Ordered Nov., 1872...	20

F.—*Table showing the re-adjustment of the rates of pay*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.
						Miles.	*Pounds.*	
21	Ala ...	6612	.....	Mobile, Montgomery.	Mobile and Montgomery...	179	2, 810	20
22	Ill	11417	.....	Galesburgh, Quincy...	Chicago, Burlington and Quincy.	100	2, 214	25
23	Mass..	706	702	Springfield, South Vernon Junction.	Connecticut River	50	2, 197	....
24	Ind ...	12028	.....	Lafayette, Kankakee .	Cincinnati, Lafayette and Chicago.	57. 35	1, 931	30
25	Ohio ..	9015	.....	Columbus, Delaware..	Cleveland, Columbus, Cincinnati and Indianapolis.	24. 75	1, 682	25
26	N. Y ..	1027	.....	Syracuse, Rochester ..	New York Central and Hudson River.	104	1, 438	....
27	Tenn..	10008	.....	Guthrie, Nashville....	Saint Louis & Southeastern	48	1, 293	21
28	Ky	9612*a*	.....	Evansville, Guthrie,..	.....do	110. 66	1, 172	21
29	Ill	11900	.....	East Saint Louis, Evansville.	.....do	164. 75	1, 105	23
30	Ill	11900	.....	Saint Louis, Evansville.	.....do	164. 75	812	23
31	Ill	11429	.....	Sterling, Alton Junction.	Rockford, Rock Island and Saint Louis.	270. 80	794	20
32	Ind ...	12017	.....	Indianapolis, Pekin...	Indianapolis, Bloomington and Western.	203	757	25
33	Ky	9738	.....	Elizabethtown, Paducah.	Elizabethtown and Paducah	185	700	18
34	Ohio ..	9012	9012	Xenia, Dayton.....	Pittsburgh, Cincinnati and Saint Louis.	17	687	25
35	Me....	204	.....	Bath, Rockland.....	Knox and Lincoln	49	684	22
36	Iowa ..	11002	.....	Keokuk, Burlington..	Chicago, Burlington and Quincy.	42. 75	657	21¼
37	Pa	1850	2445	Miles Grove, New Castle.	Erie and Pittsburgh	83	628	30
38	Ill	11431	.....	Quincy, Louisiana	Quincy, Alton & Saint Louis	43	579	25
39	Ill	11433	.....	Beardstown, Shawneetown.	Springfield and Illinois Southeastern.	229. 70	608	22
40	N. J...	1608	2126	New. York, Pemberton Junction.	New Jersey Southern	84. 60	602	22
41	Dak...	13929	.....	Sioux City, Vermillion	Dakota Southern	35. 34	483	20
42	Pa	1875	2466	Lawrenceville, Wellsborough.	Fall Brook Coal Company..	23. 50	434	16½
43	Md ...	3507	.....	Lake Roland, Hagerstown.	Western Maryland	81. 40	328	21½
44	Tex...	8577*a*	.....	Bremond, Waco	Houston and Texas Central, operating Waco and Northwestern Railway.	44. 56	407	18
45	Iil	11415	.....	Peoria, Galesburgh...	Chicago, Burlington and Quincy.	54	360	21½
46	Pa	1814	2414	Port Clinton, Williamsport.	Philadelphia and Reading..	121. 53	323	23
47	Ohio ..	9034	9034	Dayton, Richmond ...	Pittsburgh, Cincinnati and Saint Louis.	42	380	25
48	Kans .	14212	.....	Atchison, Lincoln	Atchison and Nebraska....	152. 28	294	20
49	N. Y..	1524	.....	Chatham Village, Bennington.	Harlem Extension	57. 80	281	20

per mile on certain railroad routes, &c.—Continued.

Size, &c, of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of re-adjustment or adjustment.	Remarks.	Order.
Feet and inches.		*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*			
8 by 8, f. f., s. l....	14	160 00	100 00	28, 640 00	18, 700 00	May 17, 1872	8 miles decrease. Ordered May, 1873.	21
r. p. o., 29 by 8 10	12	160 00	150 00	16, 000 00	15, 000 00	Oct. 1, 1872	.....	22
17 8½ by 6 11, f. f..	15*	150 00	125 00	7, 800 00	6, 250 00	July 1, 1869	Ordered May, 1873. $300 for side supply of Chicopee Falls from July 1, 1869.	23
14 by 8, 8 by 8, f. f., s. l.	12	150 00	.....	.....	.....	Aug. 1, 1872	New. Ordered April, 1872. Distance counted only from Templeton; comp'y to provide more room when required.	24
No apt. No r. a..	12	125 00	.....	.....	.....	Sept. 1, 1872	New. Ordered June, 1873.	25
.....	.....	125 00	100 00	13, 000 00	10, 400 00	July 1, 1872	Ordered June, 1873...	26
10 by 8, f. f.. s. l...	12	115 00	90 00	5, 520 00	4, 320 00	Jan. 1, 1873	Ordered Sept., 1873...	27
10 by 8, f. f., s. l...	12	110 00	75 00	12, 172 60	8, 299 50	Jan. 1, 1873	Ordered Sept., 1873...	28
10 by 8, f. f., s. l...	12	105 00	90 00	17, 298 75	14, 827 50	Jan. 1, 1873	Main route; branch $50, (59.) Ordered Sept., 1873.	29
12 by 9, f. f., s. l...	9*	90 00	50 00	14, 827 50	8, 237 50	April 1, 1872	Ordered March, 1873. Main route; branch $40, (70.)	30
12 by 8, f. f., s. l...	13½*	90 00	75 00	24, 372 00	20, 310 00	Oct. 1, 1872	.....	31
12 8 by 8, f. f. c., s. l.	12	90 00	.....	.....	.....	July 1, 1872	New. Ordered Jan., 1873.	32
13 by 8, f. f., s. l...	6	85 00	40 00	15, 725 00	6, 060 00	Sept. 7, 1872	Ordered Jan., 1873. 33½ miles increase.	33
20 by 8 4, f. f., s. l.	30	85 00	175 00	1, 445 00	2, 975 00	July 1, 1872	Ordered Jan., 1873....	34
13 by 6 8, f. f., d. l.	12	85 00	.....	.....	.....	Dec. 1, 1871	New. Ordered April, 1873.	35
16 by 9, f. f. c., s. l.	12	80 00	75 00	3, 420 00	3, 206 25	Oct. 1, 1872	.....	36
20 by 8 4, f. f., s. l	12	80 00	75 00	6, 640 00	6, 225 00	July 1, 1872	Ordered Jan., 1873....	37
20 by 10, f. f. c....	12	80 00	.....	.....	.....	Feb. 1, 1872	New. Ordered Jan., 1873.	38
11 by 7, f. f., s. l...	6	75 00	50 00	17, 227 50	11, 485 00	Jan. 1, 1873	.....	39
7 7 by 6 7, 7 1 by 6 7, f. f., s. l.	12	75 00	50 00	6, 345 00	4, 230 00	July 1, 1872	Ordered Dec., 1872....	40
12 by 7 6, f. f., s. l	6	75 00	.....	.....	.....	Dec. 1, 1872	New.....	41
11 by 7, f. f. c., s. l.	12	75 00	50 00	1, 762 50	1, 175 00	July 1, 1872	Part; residue $50, (62.) Ordered Feb., 1873.	42
10 by 9, f. f., d. l..	12	75 00	50 00	6, 105 00	4, 070 00	Oct. 1, 1872	.....	43
End of b. c., fixtures, s. l.	6	65 00	50 00	2, 896 40	2, 228 00	April 1, 1873	.....	44
24 8 by 8 10, f. f. c., m. c., s. l.	20½*	65 00	50 00	3, 510 00	2, 700 00	Oct. 1, 1872	.....	45
14 by 5, f. f., s. l...	6	65 00	75 00	7, 899 45	9, 114 75	July 1, 1872	Ordered Feb., 1873 ...	46
20 by 8 4, f. f., s. l.	12	60 00	175 00	2, 520 00	7, 350 00	July 1, 1872	Ordered Jan., 1873 ...	47
16 by 9, f. f., s. l...	6	60 00	50 00	9, 136 80	7, 614 00	Jan. 1, 1873	.....	48
18 by 6, fixtures, s. l.	7⅞*	60 00	50 00	3, 468 00	2, 890 00	Jan. 1, 1873	.....	49

F.—*Table showing the re-adjustment of the rates of pay*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.
						Miles.	*Pounds.*	
50	Kans .	14004	.....	Elwood, Alexandria ..	Saint Joseph and Denver City.	167. 20	222	16
51	Wis ..	13018	.....	Menasha, Stevens Point.	Phillips and Colby Construction Co., operating Wisconsin Central R. R.	65. 27	222	20
52	Ind ...	12001	.....	Indianapolis, Vincennes.	Indianapolis and Vincennes	116. 32	214	25
53	Mo ...	10521*a*	.....	Pierce City, Carthage.	Memphis, Carthage and Northwestern.	27. 31	202	20
54	Ala ...	6615	.....	Birmingham, Meridian	Alabama and Chattanooga.	154. 50	198	13
55	Mich .	12522	.....	Port Huron, Flint....	Port Huron and Lake Michigan.	68	182	18½
56	Ky ...	9742	.....	Glasgow Junction, Glasgow.	Louisville and Nashville and Great Southern.	12	175	15
57	Pa....	1849	2429	New Castle, Homewood.	Pittsburgh, Fort Wayne, and Chicago, (lessees.)	15	172	24
58	Md ...	3517	.....	Berlin, Snow Hill.....	Worcester	14	115	20
59	Ill	11900	.....	McLeansborough, Shawneetown.	Saint Louis and Southeastern.	41. 25	111	23
60	Iowa..	11020*a*	.....	Beulah, Elkader	Iowa Eastern.....	17. 75	110	10
61	Iowa..	11003*a*	.....	Chariton, Leon	Burlington and Missouri River.	37. 44	102	12
62	Pa....	1875	2466	Wellsborough, Antrim.	Fall Brook Coal Company..	13. 60	96	16¼
63	Pa....	2467	.....	Phœnixville, Eagle ...	Philadelphia and Reading..	11. 12	79	12
64	Pa....	1820	2420	Blossburgh, Fall Brook	Tioga.....	6. 85	59	16
65	Pa....	2463	.....	Topton, Kutztown ...	Philadelphia and Reading..	4. 36	50	18
66	Ala ...	6619	.....	Chehaw, Tuskegee...	Tuskegee	6	43	....
67	Md ...	3516	.....	Junction, Newtown ..	Worcester and Somerset...	9	40	20
68	Miss ..	7008	.....	Middletown, Ripley ..	Ripley	24. 30	86	15
69	N. J ..	1746	2129	Atsion, Greenwich ...	Vineland	44. 25	80	25
70	Ill	11900	.....	McLeansborough, Shawneetown.	Saint Louis and Southeastern.	41. 25	68	23
71	Pa....	1869	2461	Towanda, Bernice	Sullivan and Erie Coal and Railroad.	29. 32	62	14
72	Ohio ..	9044	.....	Marietta, Cambridge.	Marietta and Pittsburgh...	60. 11	59	20
73	Ind ...	12030	.....	Attica, Veedersburgh.	Indiana North and South, (Mathers, Chamberlain & Co., lessees.)	14	33	15

Increase over former amount of annual pay, by re-adjustment.....

per mile on certain railroad routes, &c.—Continued.

Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of re-adjustment or adjustment.	Remarks.	Order.
Feet and inches.		*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*			
12 10 by 7 8, f. f., s. l.	6	55 00	50 00	9,196 00	8,360 00	April 1, 1872	Ordered Nov., 1872...	50
7 6 by 6 10, f. f., s. l.	6	50 00	.....	.....	.....	Dec. 16, 1871	New. Ordered May, 1873.	51
20 by 8 4, f. f., s. l.	12	50 00	40 00	5,816 00	4,652 80	July 1, 1872	Ordered Jan., 1873....	52
10 by 7, f. f., s. l...	7	50 00	.....	.....	.....	July 1, 1872	New. Ordered Dec., 1872.	53
8 by 6, fixtures, s. l.	6	50 00	.....	.....	.....	June 9, 1871	New. Ordered Nov., 1872.	54
10 by 7, f. f., s. l...	6	50 00	.....	.....	.....	Jan. 1, 1871	New. Ordered Dec., 1872.	55
No apt. No r. a..	6	50 00	.....	.....	.....	Aug. 16, 1872	New. Ordered Nov., 1872.	56
.....	18	50 00	75 00	750 00	1,125 00	July 1, 1872	Ordered Jan., 1873....	57
9 2 by 4 2, f. f., s. l.	6	50 00	.....	.....	.....	July 1, 1872	New. Ordered April, 1873.	58
10 by 8, f. f., s. l...	12	50 00	40 00	2,062 50	1,650 00	Jan. 1, 1873	Ordered Sept., 1873. Branch; main route $105, (29.)	59
20 by 7, f. f., s. l...	6	50 00	.....	.....	.....	Dec. 1, 1872	New	60
23 by 9, f. f. c., s. l.	6	50 00	30 00	1,872 00	1,123 20	July 1, 1872	Ordered Oct., 1872....	61
11 by 7, f. f. c., s. l.	6	50 00	.....	.....	.....	Jan. 1, 1873	Part; residue $75, (42.) New.	62
b. c. No r. a.....	6	50 00	.....	....	.....	July 1, 1872	New. Ordered Jan., 1873.	63
11 by 7, f. f. c.....	12	50 00	75 00	342 50	513 75	July 1, 1872	Branch. Ord'd Feb., 1873.	64
b. c. No r. a	9	50 00	.....	.....	.....	July 1, 1872	New. Ordered Jan., 1873.	65
No apt. No r. a..	12	50 00	.....	.....	.....	July 1, 1872	New. Ordered Nov., 1872.	66
Passenger-car....	6	50 00	.....	.....	.....	July 1, 1872	New. Ordered Jan., 1873.	67
No apt. No r. a..	6	40 00	30 00	972 00	729 00	April 1, 1873	.....	68
8 by 7, f. f., s. l ...	6	40 00	50 00	1,770 00	2,212 50	July 1, 1872	Ordered Dec., 1872 ...	69
12 by 9, f. f., s. l...	9*	40 00	50 00	1,650 00	2,062 50	April 1, 1872	Ordered March, 1873. Branch; main route $90, (30.)	70
9 by 6, fixtures, s. l.	6	40 00	.....	.....	.....	Mar. 1, 1871	New. Ordered Jan., 1873.	71
10 by 7 6, f. f., s. l.	6	40 00	30 00	2,404 40	1,803 30	Jan. 1, 1873	.....	72
12 by 9, f. f. No r. a.	6	40 00	.....	.....	.....	Nov. 1, 1872	New	73
				1,015,508 40	791,684 85			
				791,684 85	.....			
.....				223,823 55	.....			

JOHN L. ROUTT,
Second Assistant Postmaster-General.

G.—*Statement of the number, description, and cost of mail-bags purchased by contract and put into service during the fiscal year ended June* 30, 1873.

Number.	Description.	Size.	Price.	Cost.	Aggregate.
50	Leather mail-pouches	No. 1	$8 20	$410 00	
625	....do	No. 2	6 45	4,031 25	
1,125	....do	No. 3	5 50	6,187 50	
1,000	....do	No. 4	4 35	4,350 00	
1,050	....do	No. 5	3 20	3,360 00	
3,850					$18,338 75
600	Canvas mail-pouches	No. 1	4 85	2,910 00	
800	....do	No. 2	3 90	3,120 00	
1,000	....do	No. 3	3 45	3,450 00	
800	....do	No. 4	2 89	2,312 00	
300	....do	No. 5	2 65	795 00	
3,500					12,587 00
450	Leather horse mail-bags	No. 1	6 65	2,992 50	
500	....do	No. 2	5 65	2,825 00	
300	....do	No. 3	5 15	1,545 00	
1,250					7,362 50
43,000	Jute canvas mail-sacks	No. 1	57	24,510 00	
32,000	....do	No. 2	46	14,720 00	
11,500	....do	No. 3	15	1,750 00	
86,500					40,980 00
50	Cotton canvas mail-sacks	No. 2	74½	37 25	
50	Cotton canvas mail-sacks, (striped)	.....	55	27 50	
50	....do	.....	25	12 50	
150					77 25
300	Mail-catchers	.....	15 00	4,500 00	
500	Mail-catcher's sockets	.....	50	250 00	
32	....do	.....	70	22 40	
					4,772 40
496,840	Mail-bag labels, (wooden)	.....	01¼	6,210 50	
18,000	Mail-bag label-cases	.....	25	4,500 00	
					10,710 50
					94,828 40

H.—*Number and cost of mail locks and keys purchased and repaired during the year ended June* 30, 1873.

Number.	Description.	Price.	Cost.
40,000	New iron mail-locks	$0 58	$23,200 00
5,000	New brass mail-locks	74	3,700 00
1,000	New iron mail-keys	12½	125 00
500	New iron mail-keys	20	100 00
2,577	Old iron mail-locks repaired	20	515 40
2,322	Old iron mail-locks repaired	10	232 20
2,566	Old brass mail-locks repaired	05	128 30
893	Old iron mail-keys repaired	02	17 86
	Total cost	.....	28,018 76

JOHN L. ROUTT,
Second Assistant Postmaster-General.

I.—*Railway post-office lines in the United States June* 30, 1873, *showing the increase in the service since June* 30, 1872.

Terminal points.	Miles of route.	Miles of service.	Service each way.	Number of clerks.			Increase of miles of route from June 30, 1872, to June 30, 1873.	Increase of miles of service from June 30, 1872, to June 30, 1873.	Increase in number of clerks from June 30, 1872, to June 30, 1873.			Increase in lines of railway post-offices from June 30, 1872, to June 30, 1873.
				$1,400.	$1,200.	$1,000.			$1,400.	$1,200.	$1,000.	
Atlanta, Ga., to Chattanooga, Tenn	140	280	Daily	3	3	.....	.....	.....	.....	.....	.....	.....
Albany, N. Y., to Buffalo, N. Y	298	1,192	Twice daily	11	8	8	.....	.....	2	.....	1	.....
Atlanta, Ga., to Augusta, Ga	171	342	Daily	.....	4	.....	.....	.....	.....	.....	.....	.....
Baltimore, Md., to Canandaigua, N. Y	325	650	do	6	5	.....	.....	.....	1	.....	.....	.....
Buffalo, N. Y., to Toledo, Ohio	295	1,180	Twice daily	9	15	14	.....	.....	1	(†)	6	.....
Boston, Mass., to Saint Albans, Vt	290	580	Daily	4	4	.....	.....	.....	.....	.....	.....	.....
Bloomington, Ill., to Centralia, Ill	136	272	do	4	2	.....	.....	.....	.....	.....	.....	.....
Bloomington, Ill., to Saint Louis, Mo	180	360	do	3	3	.....	.....	.....	.....	.....	.....	.....
Boston, Mass., to Albany, N. Y	200	800	Twice daily	8	8	4	.....	.....	2	(†)	4	.....
Boston, Mass., to Wellfleet, Mass	122	244	Daily	.....	6	.....	.....	.....	.....	1	.....	.....
Boston, Mass., to South Berwick, Me	74	148	do	.....	3	.....	.....	.....	.....	.....	.....	.....
Boston, Mass., to Fitchburgh, Mass	50	100	do	.....	.....	1	.....	.....	.....	.....	.....	.....
Boston, Mass., to Bangor, Me	249	996	Twice daily	11	11	.....	.....	.....	3	3	.....	.....
Bangor, Me., to Vanceborough, Me	118	236	Daily	.....	.....	2	.....	.....	.....	.....	.....	.....
Bristol, Tenn., to Chattanooga, Tenn	242	484	do	4	6	.....	.....	.....	.....	.....	.....	.....
Burlington, Iowa, to Council Bluffs, Iowa	291	582	do	4	4	.....	.....	.....	(†)	(†)	.....	.....
Chicago, Ill., to Green Bay, Wis	242	484	do	6	6	.....	.....	.....	1	.....	.....	.....
Chicago, Ill., to Quincy, Ill	263	526	do	6	10	.....	.....	.....	1	1	.....	.....
Chicago, Ill., to Dunleith, Ill	188	376	do	5	4	.....	.....	.....	.....	.....	.....	.....
Chicago, Ill., to Iowa City, Iowa	237	474	do	6	6	.....	.....	.....	(†)	(‡)	.....	.....
Chicago, Ill., to Cedar Rapids, Iowa	219	438	do	3	6	.....	.....	.....	(†)	1	.....	.....
Chicago, Ill., to Centralia, Ill	258	516	do	5	8	.....	.....	.....	.....	3	.....	.....
Chicago, Ill., to Toledo, Ohio*	243	972	Twice daily	7	12	12	.....	.....	(†)	4	6	.....
Chicago, Ill., to Saint Louis, Mo	280	560	Daily	5	7	.....	.....	.....	(†)		.....	.....
Centralia, Ill., to Cairo, Ill	112	224	do	1	5	.....	.....	.....	(‡)		.....	.....
Columbus, Ky., (by river,) to Cairo, Ill	21	168	Four times daily	.....	2	.....	.....	.....	(†)		.....	.....
Clinton, Iowa, to Council Bluffs, Iowa	350	700	Daily	4	5	.....	.....	.....	1	(†)	.....	.....
Cincinnati, Ohio, to Saint Louis, Mo	340	680	do	6	7	.....	.....	.....	.....	1	.....	.....
Cleveland, Ohio, to Indianapolis, Ind	282½	565	do	5	4	.....	.....	.....	.....	(‡)	.....	.....
Cleveland, Ohio, to Cincinnati, Ohio	244	488	do	4	6	.....	244	488	4	6	.....	1
Dubuque, Iowa, to Fort Dodge, Iowa	214	428	do	4	2	.....	.....	.....	.....	.....	.....	.....
Detroit, Mich., to Chicago, Ill	284	568	do	4	6	.....	.....	.....	.....	1	.....	.....
Davenport, Iowa, to Council Bluffs, Iowa	307	614	do	4	7	.....	.....	.....	.....	2	.....	.....
Freeport, Ill., to Bloomington, Ill	139	278	do	2	4	.....	.....	.....	(†)	2	.....	.....

* Embraces former line between Toledo, Ohio, and Elkhart, Ind., discontinued since last report. † Reduction of one. ‡ Reduction of two.

I.—*Railway post-office lines in the United States, &c.*—Continued.

Terminal points.	Miles of route.	Miles of service.	Service each way.	Number of clerks.			Increase of miles of route from June 30, 1872, to June 30, 1873.	Increase of miles of service from June 30, 1872, to June 30, 1873.	Increase in number of clerks from June 30, 1872, to June 30, 1873.			Increase in lines of railway post-offices from June 30, 1872, to June 30, 1873.
				$1,400.	$1,200.	$1,000.			$1,400.	$1,200.	$1,000.	
Humboldt, Tenn., to Jackson, Miss	276	552	do	4	6					2		
Indianapolis, Ind., to Saint Louis, Mo	261	522	do	5	3					(†)		
Kansas City, Mo., to Council Bluffs, Iowa	200	400	do	3	4					(†)		
Louisville, Ky., to Nashville, Tenn	185	370	Daily	3	3							
La Fayette, Ind., to Quincy, Ill	273	546	do	5	12				1	7		
Lynchburgh, Va., to Bristol, Tenn	203	406	do	4	4							
Milwaukee, Wis., to Saint Paul, Minn	324	648	do	7	10				2	(†)		
Memphis, Tenn., to Chattanooga, Tenn	310	620	do	6	7				1	1		
New Orleans, La., to Canton, Miss	206	412	do		4		206	412		4		1
New York, N. Y., to Boston, Mass	234	936	Twice daily	11	8	19			1		9	
New York, N. Y., to Washington, D. C	232	928	do	11	15	7			1	(†)	3	
New York, N. Y., to Buffalo, N. Y	422	1,688	do	13	12	13			1	1	7	
New York, N. Y., to Albany, N. Y	144	576	do	4	4	5				(†)	1	
Omaha, Nebr., to Ogden, Utah	1,032	2,064	Daily	15	20							
Philadelphia, Pa., to Pittsburgh, Pa	358	716	do	7	6	5						
Peoria, Ill., to Burlington, Iowa	96	192	do	2	2				1			
Quincy, Ill., to Kansas City, Mo	261	522	do	4	6							
Rochester, N. Y., to Niagara Falls, N. Y	77	154	do		3							
Saint Louis, Mo., to Atchison, Kans	330	660	do	6	6							
San Francisco, Cal., to Ogden, Utah	881	1,762	do	11	14				(†)	2		
Sedalia, Mo., to Denison, Tex	432	864	do		14		432	864		14		1
Toledo, Ohio, to La Fayette, Ind	203	406	do	4	6					1		
Washington, D. C., to Weldon, N. C	216	864	Twice daily	10	16				2	4		
Washington, D. C., to Lynchburgh, Va	178	356	Daily	4	5					1		
Hornellsville, N. Y., to Dunkirk, N. Y*	128	256	do									

* Number of clerks included in New York, N. Y., to Buffalo, N. Y. † Reduction of one.

Recapitulation and comparative statement of the service of June 30, 1872, and June 30, 1873, showing the increase.

	June 30, 1872.		June 30, 1873.		Increase.	
Number of lines of railway post-offices		57		59		2
Aggregate number of miles of the above		14,117		14,866		749
Number of miles of actual service performed daily		33,690		34,925		1,235
Number of miles of actual service performed annually		12,296,850		12,747,625		450,775
Number of head clerks at $1,400 per annum	267		283		16	
Number of clerks at $1,200 per annum	329		379		50	
Number of assistant clerks at $1,000 per annum	53		90		37	
Making total number of clerks		649		752		103
With annual compensation amounting to		$821,600 00		$941,000 00		$119,400 00

JOHN L. ROUTT,
Second Assistant Postmaster-General.

THROUGH MAIL TABLES.

1.—*Through mails to San Francisco from Washington.*

ROUTE.—From Washington, D. C., via Baltimore, Md., Harrisburgh, Pa., Pittsburgh, Pa., Chicago, Ill., Clinton, Iowa, (till August 31, 1873, and afterward from Washington, D. C., via Parkersburgh, W. Va., Cincinnati, Ohio, Peoria, Ill., Galesburgh, Ill., Burlington, Iowa,) Omaha City, Nebr., Ogden, Utah, Sacramento City, Cal., Stockton, Cal., and Oakland, Cal., to San Francisco, Cal.—3,250 miles, (3,151 miles via Parkersburgh.)

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	30	5,197 35	173 15	169 25	217 30	25	5	3	.....	4
November, 1872	28	4,864 10	173 43	169 00	194 15	20	8	4	.....	6
December, 1872	30	5,345 55	178 11	169 00	217 35	19	11	9	.....	6
January, 1873	30	5,773 35	192 27	169 00	218 10	3	27	27	.....	5
February, 1873	26	5,096 40	196 01	169 15	221 05	1	25	25	.....	7
March, 1873	32	6,067 10	189 35	169 15	217 15	11	21	21	.....	5
April, 1873	31	5,598 30	180 35	169 15	244 45	19	12	11	.....	9
May, 1873	31	5,418 35	174 47	168 05	216 15	22	9	7	.....	5
June, 1873	30	5,306 35	176 53	168 10	216 20	21	9	9	.....	6
July, 1873	31	5,309 35	171 16	168 15	193 55	29	2	2	.....	2
August, 1873	31	5,444 45	175 38	169 50	199 55	24	7	7	.....	4
September, 1873	29	5,404 25	186 21	166 25	214 20	7	22	22	.....	6
Whole period ...	359	64,827 30	180 34	166 25	244 45	201	158	147	.....	65

2.—*Through mails to Washington from San Francisco.*

ROUTE.—From San Francisco, Cal., via Oakland, Cal., Stockton, Cal., Sacramento City, Cal., Ogden, Utah, Omaha City, Nebr., Clinton, Iowa, Chicago, Ill., Pittsburgh, Pa., Harrisburgh, Pa., and Baltimore, Md., (till August 31, 1873, and afterward, after passing Omaha, Nebr., via Burlington, Iowa, Galesburgh, Ill., Peoria, Ill., Cincinnati, Ohio, and Parkersburgh, W. Va.,) to Washington, D. C.—3,250 miles, (3,151 miles via Parkersburgh.)

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	31	5,281 10	170 21	167 10	192 00	24	7	1	.....	1
November, 1872	30	5,165 00	172 10	167 10	196 30	18	12	3	.....	2
December, 1872	31	5,385 00	173 42	167 10	192 45	14	17	2	.....	2
January, 1873	30	5,358 10	178 36	168 30	203 55	16	14	6	.....	5
February, 1873	29	5,244 30	180 50	168 00	216 10	14	15	8	.....	6
March, 1873	31	5,523 25	178 10	167 10	207 20	12	19	6	.....	4
April, 1873	30	5,366 35	178 53	168 00	264 00	13	17	4	.....	4
May, 1873	31	5,506 30	177 37	167 10	196 30	12	19	7	.....	4
June, 1873	30	5,191 40	173 03	166 50	216 00	22	8	4	.....	3
July, 1873	31	5,299 55	170 57	166 00	194 00	22	9	3	.....	3
August, 1873	31	5,579 25	179 58	169 55	300 15	16	15	3	1	2
September, 1873	30	5,162 05	172 04	169 45	178 30	27	3	.....	.....	.....
Whole period...	365	64,063 15	175 30	166 00	300 15	210	155	47	1	36

3.—*Through mails to San Francisco from New York.*

ROUTE.—From New York, N. Y., via Harrisburgh, Pa., Pittsburgh, Pa., (also from New York, via Erie, Pa.,) Chicago, Ill., Clinton, Iowa, Omaha City, Nebr., Ogden, Utah, Sacramento City, Cal., Stockton, Cal., and Oakland, Cal., to San Francisco, Cal.—3,307 miles, (3,370 miles via Erie, Pa.)

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872.....	58	10,221 35	172 47	171 10	186 00	54	4	.....	.....	2
November, 1872.....	53	9,358 10	176 34	171 00	188 00	49	4	.....	.....	.....
December, 1872.....	49	8,661 15	176 45	171 10	186 15	46	3	.....	.....	3
January, 1873.....	28	5,500 55	196 27	171 10	220 10	4	24	24	.....	7
February, 1873.....	25	5,025 45	201 01	173 30	247 05	2	23	23	.....	9
March, 1873.....	31	5,538 15	178 39	171 10	219 15	22	9	9	.....	2
April, 1873.....	48	8,779 05	183 18	169 15	256 45	37	11	9	.....	6
May, 1873.....	56	9,926 20	177 15	168 05	204 20	45	11	6	.....	4
June, 1873.....	51	9,062 30	177 41	168 10	204 30	43	8	8	.....	3
July, 1873.....	53	9,315 55	175 46	168 00	204 30	50	3	3	.....	1
August, 1873.....	56	9,837 45	175 40	168 05	204 30	51	5	4	.....	3
September, 1873.....	54	9,414 50	174 20	168 00	181 20	54	.....	.....	.....	.....
Whole period...	562	100,642 20	179 04	168 00	256 45	457	105	86	.....	40

4.—*Through mails to New York from San Francisco.*

ROUTE.—From San Francisco, Cal., via Oakland, Cal., Stockton, Cal., Sacramento City, Cal., Ogden, Utah, Omaha City, Nebr., Clinton, Iowa, Chicago, Ill., Pittsburgh, Pa., and Harrisburgh, Pa., (also, after passing Chicago, via Erie, Pa.,) to New York, N. Y.—3,307 miles, (3,370 miles via Erie, Pa.)

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m*	*h.* *m.*					
October, 1872.....	31	5,283 15	170 25	168 10	192 15	29	2	1	.....	1
November, 1872.....	30	5,205 40	173 31	168 50	194 00	23	7	4	.....	3
December, 1872.....	31	5,474 15	176 35	169 00	194 40	14	17	5	.....	3
January, 1873.....	30	5,359 05	178 38	170 00	197 40	10	20	6	.....	5
February, 1873.....	29	5,259 40	181 13	170 15	215 20	9	20	7	.....	5
March, 1873.....	31	5,669 35	182 53	169 00	203 15	16	15	5	.....	5
April, 1873.....	30	5,361 15	178 42	168 10	263 30	18	12	4	.....	4
May, 1873.....	31	5,469 30	176 26	168 40	197 30	16	15	5	1	3
June, 1873.....	30	5,219 15	173 58	168 10	217 00	23	7	4	.....	3
July, 1873.....	31	5,307 50	171 13	168 40	193 15	27	4	1	.....	1
August, 1873.....	31	5,356 05	172 46	168 15	193 20	22	9	2	.....	1
September, 1873.....	30	5,076 25	169 12	168 00	175 10	28	2	.....	.....	.....
Whole period...	365	64,046 50	175 28	168 00	263 30	235	130	44	1	34

5.—*Through mails to San Francisco from Boston.*

ROUTE.—From Boston, Mass., via Albany, N. Y., Buffalo, N. Y., Erie, Pa., Toledo, Ohio, Chicago, Ill., Clinton, Iowa, Omaha City, Nebr., Ogden, Utah, Sacramento City, Cal., Stockton, Cal., and Oakland, Cal., to San Francisco, Cal.—3,449 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872.....	31	5,726 10	184 42	184 10	190 00	29	2	.....	.....	2
November, 1872*....	16	2,953 55	184 37	174 15	193 45	15	1	.....	.....	1
December, 1872*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
January, 1873*.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February, 1873.....	25	4,662 35	178 30	174 05	208 05	16	9	6	.....	4
March, 1873.....	51	9,434 20	184 59	174 10	232 05	38	13	5	.....	.....
April, 1873	32	5,946 15	185 52	174 15	249 45	30	2	2	.....	4
May, 1873.....	31	5,551 15	179 04	173 05	197 20	25	6	5	.....	4
June, 1873.....	48	8,764 30	182 35	172 10	207 30	38	10	10	.....	3
July, 1873.....	45	8,087 45	179 43	172 10	207 30	44	1	1	.....	1
August, 1873.....	31	5,737 10	185 04	183 05	207 30	28	3	2	.....	3
September, 1873.....	30	5,500 20	183 20	183 10	184 20	30	.....	.....	.....	.....
Whole period...	340	62,364 15	183 25	172 10	249 45	293	47	31	.....	22

*Returns interrupted; great fire at Boston.

6.—*Through mails to Boston from San Francisco.*

ROUTE.—From San Francisco, Cal., via Oakland, Cal., Stockton, Cal., Sacramento City, Cal., Ogden, Utah, Omaha City, Nebr., Clinton, Iowa, Chicago, Ill., Toledo, Ohio, Erie, Pa. Buffalo, N. Y., and Albany, N. Y., to Boston, Mass.—3,449 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872.....	31	5,456 30	176 00	172 15	200 45	22	9	1	.....	4
November, 1872.....	30	5,286 30	176 13	172 00	196 45	18	12	2	.....	3
December, 1872.....	31	5,555 30	179 12	171 45	197 15	14	17	7	.....	5
January, 1873	30	5,495 00	183 10	172 30	215 00	8	22	8	.....	7
February, 1873	29	5,283 45	182 11	172 30	203 45	7	22	7	.....	7
March, 1873	31	5,594 30	180 28	172 00	216 30	14	17	6	.....	6
April, 1873.....	30	5,584 15	186 05	171 45	273 00	11	19	7	.....	7
May, 1873.....	31	5,598 45	180 36	170 30	200 45	14	17	6	.....	5
June, 1873	30	5,280 30	176 01	169 45	219 45	24	6	3	.....	4
July, 1873.....	31	5,398 45	174 09	167 45	201 15	25	6	3	.....	3
August, 1873.....	31	5,426 30	175 02	170 00	195 00	24	7	3	.....	3
September, 1873.....	30	5,190 45	173 01	169 30	190 00	27	3	2	.....	2
Whole period...	365	65,151 15	178 29	167 45	273 00	208	157	55	.....	56

7.—*Through mails to San Francisco from Cincinnati.*

ROUTE.—From Cincinnati, Ohio, via Chicago, Ill., Clinton, Iowa, (till August 31, 1873, and afterward from Cincinnati, Ohio, via Peoria, Ill., Galesburg, Ill., Burlington, Iowa,) Omaha City, Nebr., Ogden, Utah, Sacramento City, Cal., Stockton, Cal., and Oakland, Cal., to San Francisco, Cal.—2,702 miles, (2,539 miles via Peoria.)

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872.....	30	4,474 05	149 08	146 10	170 20	25	5	3	.....	4
November, 1872.....	29	4,645 00	160 10	145 10	177 00	12	17	17	.....	6
December, 1872.....	30	4,766 00	158 52	145 00	196 50	15	15	14	.....	9
January, 1873.....	30	5,125 55	170 51	169 00	194 10	.....	30	30	.....	2
February, 1873.....	24	4,203 30	175 08	147 30	217 15	1	23	23	.....	10
March, 1873.....	28	4,642 15	165 47	145 10	193 15	6	22	22	.....	5
April, 1873.....	29	5,135 50	177 05	145 15	244 45	2	27	27	.....	10
May, 1873.....	28	4,529 25	161 45	144 05	192 20	10	18	18	.....	9
June, 1873.....	28	4,400 30	157 09	144 05	192 30	14	14	14	.....	7
July, 1873.....	31	4,593 05	148 09	144 00	168 30	26	5	5	.....	4
August, 1873	30	4,624 35	154 05	144 10	192 20	18	12	11	.....	10
September, 1873.....	29	4,473 40	154 15	144 10	169 20	17	12	12	.....	7
Whole period...	346	59,613 50	172 17	144 00	244 45	146	200	196	.....	83

8.—*Through mails to Cincinnati from San Francisco.*

ROUTE.—From San Francisco, Cal., via Oakland, Cal., Stockton, Cal., Sacramento City, Cal., Ogden, Utah, Omaha City, Nebr., Clinton, Iowa, and Chicago, Ill., (till August 31, 1873, and afterward, after passing Omaha, Nebr., via Burlington, Iowa, Galesburgh, Ill., and Peoria, Ill.,) to Cincinnati, Ohio—2,702 miles, (2,539 miles via Peoria.)

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872.....	31	4,614 55	148 52	135 55	183 00	7	24	6	.....	4
November, 1872.....	30	4,575 30	152 34	134 20	191 20	7	23	8	.....	8
December, 1872.....	31	4,552 45	146 51	138 00	170 15	12	19	2	.....	2
January, 1873.....	30	4,854 10	161 48	139 30	206 00	4	26	14	1	9
February, 1873.....	29	4,672 10	161 06	143 00	185 40	5	24	13	.....	7
March, 1873.....	31	4,867 20	157 00	146 05	197 40	15	16	10	.....	9
April, 1873.....	30	4,762 30	158 45	137 40	230 20	17	13	6	.....	7
May, 1873.....	31	4,673 20	150 45	135 30	179 20	8	23	5	.....	6
June, 1873	30	4,360 20	145 20	122 50	173 40	4	26	19	.....	7
July, 1873.....	32	4,531 45	141 37	135 35	160 35	18	14	2	.....	7
August, 1873.....	30	4,379 55	145 59	135 35	172 20	16	14	7	.....	13
September, 1873.....	30	4,340 50	144 41	125 45	162 45	11	19	6	.....	5
Whole period...	365	55,185 30	151 11	122 50	230 20	124	241	98	1	84

9.—*Through mails to San Francisco from Chicago.*

ROUTE.—From Chicago, Ill., via Clinton, Iowa, Omaha City, Nebr., Ogden, Utah, Sacramento City, Cal., Stockton, Cal., and Oakland, Cal., to San Francisco, Cal.—2,406 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	31	4,114 20	132 43	132 10	138 00	29	2	.....	.....	2
November, 1872*	24	3,191 55	132 59	130 45	141 45	23	1	.....	.....	2
December, 1872*	8	1,078 25	134 33	131 05	155 35	6	2	1	.....	1
January, 1873	31	4,190 10	135 10	131 00	180 10	27	4	4	.....	3
February, 1873	26	3,606 50	138 43	132 00	184 05	19	7	5	.....	9
March, 1873	31	4,164 00	134 19	131 05	155 15	27	4	4	.....	.....
April, 1873	30	4,125 00	137 30	131 10	206 45	25	5	.....	.....	5
May, 1873	30	4,040 55	134 41	130 05	154 25	22	8	5	.....	4
June, 1873	30	3,981 05	132 42	130 05	154 30	27	3	3	.....	3
July, 1873	31	4,063 00	131 03	130 00	154 30	30	1	.....	.....	1
August, 1873	31	4,092 30	132 00	130 05	154 30	28	3	2	.....	3
September, 1873	30	3,902 50	130 05	129 45	131 05	30	.....	.....	.....	.....
Whole period...	333	44,551 00	136 47	129 45	206 45	293	40	24	.....	33

* No post-bills from Chicago from November 19 to December 25, 1872.

10.—*Through mails to Chicago from San Francisco.*

ROUTE.—From San Francisco, Cal., via Oakland, Cal., Stockton, Cal., Sacramento City, Cal., Ogden, Utah, Omaha City, Nebr., and Clinton, Iowa, to Chicago, Ill.—2,406 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	31	4,010 30	129 22	128 30	130 30	31	.....	.....	.....	.....
November, 1872	30	3,890 40	129 41	129 10	130 20	30	.....	.....	.....	.....
December, 1872	31	4,039 15	130 17	128 50	134 10	29	2	.....	.....	.....
January, 1873	31	4,063 00	131 03	128 40	145 05	26	5	.....	.....	1
February, 1873	28	3,638 55	129 57	129 00	138 45	26	2	.....	.....	1
March, 1873	31	4,044 30	130 28	129 10	154 00	30	1	1	.....	1
April, 1873	30	4,088 35	136 17	128 45	216 30	26	4	3	.....	4
May, 1873	31	4,023 10	129 46	129 00	134 50	28	3	.....	.....	.....
June, 1873	30	3,888 40	129 37	128 45	144 45	29	1	.....	.....	1
July, 1873	31	4,012 45	129 26	128 45	138 10	30	1	.....	.....	1
August, 1873	31	4,014 10	129 29	128 45	136 10	29	2	.....	.....	.....
September, 1873	30	3,873 55	129 07	128 50	130 10	30	.....	.....	.....	.....
Whole period...	365	47,588 05	130 22	128 30	216 30	344	21	4	.....	9

11.—*Through mails to San Francisco from Saint Louis.*

ROUTE.—From Saint Louis, Mo., via Kansas City, Mo., Denver City, Colo., Cheyenne, Wyo., Ogden, Utah, Sacramento City, Cal., Stockton, Cal., and Oakland, Cal., to San Francisco, Cal.—2,400 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872.....	31	4,180 30	134 51	132 45	157 05	27	4	2	.....	4
November, 1872.....	29	3,952 35	136 17	132 35	157 10	22	7	3	.....	7
December, 1872	29	4,075 35	140 32	132 35	171 50	19	10	7	.....	6
January, 1873.....	29	4,219 45	145 30	132 35	181 40	18	11	11	.....	10
February, 1873.....	26	3,784 15	145 32	132 35	184 40	14	12	10	.....	9
March 1873.....	31	4,237 30	136 41	132 45	156 55	26	5	5	.....	3
April, 1873.....	31	4,421 45	142 38	132 45	208 20	21	10	9	.....	8
May, 1873	30	4,136 55	137 53	131 40	156 05	21	9	7	.....	5
June, 1873	30	4,053 05	135 06	131 40	156 15	26	4	4	.....	4
July, 1873.....	31	4,327 40	139 36	131 35	156 05	21	10	10	.....	4
August, 1873.....	30	4,033 55	134 27	131 45	156 05	26	4	3	.....	5
September, 1873.....	30	3,957 50	131 55	131 45	132 55	30	.....	.....	.....	.....
Whole period ...	357	49,381 20	138 19	131 40	208 20	271	86	71	.....	65

12.—*Through mails to Saint Louis from San Francisco.*

ROUTE.—From San Francisco, Cal., via Oakland, Cal., Stockton, Cal., Sacramento City, Cal., Ogden, Utah, Cheyenne, Wyo., Denver City, Colo., and Kansas City, Mo., to Saint Louis, Mo.—2,400 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872.....	30	3,986 10	132 52	126 00	150 00	19	11	6	.....	8
November, 1872.....	31	4,282 00	138 07	126 00	174 00	14	17	10	.....	6
December, 1872.....	31	4,259 00	137 23	126 00	168 00	14	17	7	1	9
January, 1873.....	30	4,015 30	133 51	126 00	156 30	17	13	4	.....	5
February, 1873.....	28	3,758 50	134 14	124 30	168 00	17	11	5	.....	7
March, 1873.....	32	4,400 45	137 31	124 30	182 30	14	18	8	.....	8
April, 1873.....	30	4,283 45	142 53	124 30	222 00	12	18	7	1	11
May, 1873.....	31	4,181 45	134 53	120 30	150 00	14	17	4	.....	6
June, 1873	30	4,028 30	134 17	124 30	155 30	14	16	7	.....	5
July, 1873.....	31	4,088 55	131 54	124 30	157 45	22	9	4	.....	5
August, 1873.....	30	4,018 15	133 56	125 30	168 00	19	11	7	.....	8
September, 1873.....	31	4,070 55	131 19	125 30	151 35	22	9	4	.....	5
Whole period ...	365	49,374 20	135 16	120 30	222 00	198	167	73	2	83

13.—*Through mails to New Orleans from Washington.*

ROUTE.—From Washington, D. C., via Lynchburgh, Va., Bristol, Tenn., Knoxville, Tenn., Cleveland, Tenn., Dalton, Ga., Calera, Ala., Montgomery, Ala., and Mobile, Ala., to New Orleans, La.—1,188 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	57	4,484 20	78 40	66 00	124 00	16	41	28	1	2
November, 1872	51	4,135 52	81 05	65 00	117 00	12	39	36	.....	4
December, 1872*	51	4,686 00	91 52	66 10	277 15	13	38	30	7	5
January, 1873*	61	5,319 20	87 12	74 00	128 30	1	60	32	4	2
February, 1873*	56	4,850 15	86 36	70 30	118 00	1	55	34	6	4
March, 1873*	59	4,956 15	84 00	79 00	103 15	.....	59	25	.....	.....
April, 1873*	59	4,910 00	83 13	70 00	105 30	7	52	25	6	.....
May, 1873	60	4,793 05	79 53	70 00	100 30	26	34	27	20	.....
June, 1873	55	4,326 45	78 40	70 00	94 00	24	31	26	20	1
July, 1873	33	2,451 00	74 16	70 15	94 30	26	7	5	1	2
August, 1873	31	2,207 00	71 11	70 15	94 39	30	1	1	.....	1
September, 1873	30	2,183 30	72 47	70 15	94 15	27	3	3	.....	3
Whole period...	603	49,303 42	81 45	65 00	277 15	183	420	272	65	24

* Mails diverted via Grand Junction from December 20, 1872, to April 20, 1873.

14.—*Through mails to Washington from New Orleans.*

ROUTE.—From New Orleans, La., via Mobile, Ala., Montgomery, Ala., Calera, Ala., Dalton, Ga., Cleveland, Tenn., Knoxville, Tenn., Bristol, Tenn., and Lynchburgh, Va., to Washington, D. C.—1,188 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	31	2,084 15	67 14	62 00	98 00	24	7	7	.....	5
November, 1872	29	2,039 50	70 20	62 15	87 25	18	11	11	.....	6
December, 1872	31	2,792 20	90 04	61 45	232 00	11	20	20	3	8
January, 1873	31	2,520 50	81 19	62 05	122 15	2	29	29	.....	9
February, 1873	27	2,300 25	85 12	67 15	124 15	2	25	13	1	8
March, 1873	33	2,654 15	80 25	66 55	122 15	13	20	13	.....	6
April, 1873	30	2,074 55	69 09	66 55	98 15	26	4	2	1	2
May, 1873	31	2,217 30	74 45	62 50	107 15	22	9	5	1	4
June, 1873	30	1,977 55	65 55	62 00	91 50	23	5	5	.....	1
July, 1873	31	1,964 30	63 22	62 05	74 05	29	2	2	.....	.....
August, 1873	31	1,945 30	62 45	62 00	64 00	31	.....	.....	.....	.....
September, 1873	30	2,035 20	67 50	62 20	96 45	24	6	6	.....	3
Whole period...	365	26,607 35	72 53	61 45	232 00	227	138	113	6	52

15.—*Through mails to New Orleans from New York.*

SOUTHWESTERN ROUTE.—From New York, N. Y., via Washington, D. C., Lynchburgh, Va., Bristol, Tenn., Knoxville, Tenn., Cleveland, Tenn., Dalton, Ga., Calera, Ala., Montgomery, Ala., and Mobile, Ala., to New Orleans, La.—1,418 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	30	3,057 36	101 55	74 54	287 59	6	24	22	1	8
November, 1872	28	2,653 18	94 45	74 59	114 59	2	26	26	.....	8
December, 1872*	30	3,057 36	101 55	74 54	287 59	6	24	22	1	8
January, 1873*	30	2,917 40	97 15	74 14	137 14	2	28	23	1	8
February, 1873*	27	2,629 23	97 23	85 29	116 24	.....	27	20	1	5
March, 1873*	31	2,940 50	94 51	87 44	111 59	.....	31	31	.....	3
April, 1873*	30	2,628 45	87 37	78 44	111 44	8	22	5	.....	2
May, 1873	31	2,513 01	81 03	74 30	103 14	27	4	3	.....	3
June, 1873	30	2,430 00	81 00	79 00	103 15	27	3	3	.....	1
July, 1873	31	2,464 45	79 30	79 15	79 30	31	.....	.....	.....	.....
August, 1873	31	2,535 15	81 46	79 15	103 30	28	3	3	.....	2
September, 1873	30	2,460 20	82 00	79 15	103 30	26	4	3	.....	2
Whole period...	359	32,288 29	89 56	74 14	287 59	163	196	161	4	50

* Mails diverted via Grand Junction from December 20, 1872, to April 20, 1873.

WESTERN ROUTE.—From New York, N. Y., via Harrisburgh, Pa., Pittsburgh, Pa., Columbus, Ohio, Cincinnati, Ohio, Louisville, Ky., Bowling Green, Ky., Humboldt, Tenn., Grand Junction, Tenn., and Canton, Miss., to New Orleans, La.—1,608 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	27	2,382 25	88 14	72 55	121 05	10	17	16	.....	8
November, 1872	23	1,947 44	84 41	73 55	107 35	12	11	11	.....	8
December, 1872	28	2,814 09	100 30	74 25	124 25	3	25	25	.....	10
January, 1873	27	2,787 58	103 15	75 00	139 35	1	26	26	.....	9
February, 1873	22	2,267 40	103 04	87 15	129 00	.....	22	21	.....	7
March, 1873	28	2,894 25	103 22	76 00	153 10	1	27	27	1	6
April, 1873	26	2,340 05	90 00	76 00	124 00	11	15	15	.....	10
May, 1873	28	2,333 30	83 20	73 00	101 00	17	11	11	.....	7
June, 1873	26	2,253 30	86 40	73 15	121 15	13	13	13	.....	10
July, 1873	31	2,415 55	77 55	73 10	110 30	24	7	6	1	5
August, 1873	31	2,316 45	74 44	73 00	97 45	28	3	2	.....	1
September, 1873	29	2,325 15	80 10	73 15	113 00	19	10	10	.....	5
Whole period...	326	29,079 21	89 12	72 55	153 10	139	187	173	2	86

16.—*Through mails to New York from New Orleans.*

SOUTHWESTERN ROUTE.—From New Orleans, La., via Mobile, Ala., Montgomery, Ala., Calera, Ala., Dalton, Ga., Cleveland, Tenn., Knoxville, Tenn., Bristol, Tenn., Lynchburgh, Va., and Washington, D. C., to New York, N. Y.—1,418 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.		Average time.		Shortest time.		Longest time.		Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h.	*m.*	*h.*	*m.*	*h.*	*m.*	*h.*	*m.*					
October, 1872	31	2,564	45	82	44	72	00	109	50	14	17	17	.....	10
November, 1872	29	2,520	50	86	55	72	15	110	45	11	18	18	.....	11
December, 1872	29	3,090	15	106	33	72	15	255	05	5	24	24	2	12
January, 1873	32	3,027	40	94	36	85	55	134	15	.....	32	32	.....	5
February, 1873	27	2,564	20	94	58	85	45	134	25	.....	27	27	1	7
March, 1873	30	2,859	40	95	19	85	45	122	15	.....	30	30	.....	5
April, 1873	31	2,727	55	87	50	85	45	110	00	.....	31	31	.....	1
May, 1873	32	2,804	05	87	37	72	00	120	25	3	29	29	1	4
June, 1873	30	2,442	45	81	25	72	00	120	00	17	13	13	.....	8
July, 1873	31	2,296	55	74	05	72	00	87	20	27	4	4	.....	3
August, 1873	30	2,292	40	76	25	72	15	89	10	21	9	8	.....	6
September, 1873	31	2,408	25	77	41	72	00	110	45	18	13	13	.....	7
Whole period ...	363	31,600	15	87	03	72	00	255	05	116	247	246	4	79

WESTERN ROUTE.—From New Orleans, La., via Canton, Miss., Grand Junction, Tenn., Humboldt, Tenn., Bowling Green, Ky., Louisville, Ky., Cincinnati, Ohio, Columbus, Ohio, Pittsburgh, Pa., and Harrisburgh, Pa., to New York, N. Y.—1,608 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time. occupied.		Average time.		Shortest time.		Longest time.		Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h.	*m.*	*h.*	*m.*	*h.*	*m.*	*h.*	*m.*					
October, 1872	27	2,324	50	86	06	76	00	102	10	13	14	10	.....	6
November, 1872	24	2,059	40	85	49	77	20	104	20	12	12	8	.....	9
December, 1872	25	2,449	15	97	58	77	00	128	30	4	21	17	.....	13
January, 1873	26	2,585	05	99	25	74	30	123	10	3	23	21	.....	8
February, 1873	24	2,489	25	103	43	79	30	127	15	1	23	19	.....	9
March, 1873	25	2,530	05	101	12	79	10	124	30	2	23	20	.....	9
April, 1873	26	2,258	25	86	51	76	35	103	00	11	15	10	.....	7
May, 1873	26	2,229	05	85	44	78	05	104	10	10	16	8	.....	9
June, 1873	23	2,024	55	88	00	77	50	104	10	12	11	11	.....	8
July, 1873	30	2,747	00	91	34	75	50	102	50	2	28	21	.....	3
August, 1873	30	2,417	50	80	35	75	55	96	25	18	12	4	.....	4
September, 1873	24	1,974	50	82	17	75	55	96	55	14	10	3	.....	9
Whole period ...	310	28,090	25	90	36	74	30	128	30	102	208	152	.....	94

17.—*Through mails to Memphis from New York.*

SOUTHWESTERN ROUTE.—From New York, N. Y., via Washington, D. C., Lynchburgh, Va., Bristol, Tenn., Knoxville, Tenn., Chattanooga, Tenn., and Grand Junction, Tenn., to Memphis, Tenn.—1,165 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	31	1,991 09	64 13	61 59	85 59	27	4	4	.....	1
November, 1872	30	1,949 25	64 58	61 34	85 34	23	7	7	.....	1
December, 1872	40	2,712 41	67 49	61 34	98 10	27	13	13	.....	1
January, 1873	36	2,448 51	68 01	61 34	109 34	20	16	16	1	3
February, 1873	41	2,835 05	69 13	61 34	98 29	25	16	12	2	4
March, 1873	31	2,138 30	68 59	61 34	89 14	16	15	15	.....	3
April, 1873	29	1,838 54	63 24	61 34	73 40	26	3	3	.....	1
May, 1873	31	1,921 26	61 58	61 34	70 14	30	1	.....	.....	.....
June, 1873	30	1,860 00	62 00	62 00	62 00	30	.....	.....	.....	.....
July, 1873	31	1,922 00	62 00	62 00	62 00	31	.....	.....	.....	.....
August, 1873	31	1,970 50	63 34	62 00	86 00	29	2	2	.....	1
September, 1873	30	1,950 55	65 01	62 00	86 00	25	5	5	.....	1
Whole period...	391	25,539 46	65 19	61 34	109 34	309	82	77	3	16

WESTERN ROUTE.—From New York, N. Y., via Harrisburgh, Pa., Pittsburgh, Pa., Columbus, Ohio, Cincinnati, Ohio, Louisville, Ky., Bowling Green, Ky., and Humboldt, Tenn., to Memphis, Tenn.—1,229 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	31	1,867 00	60 13	57 45	74 00	28	3	1	.....	.....
November, 1872	43	2,628 05	61 07	57 50	72 15	41	2	2	.....	.....
December, 1872	43	2,674 25	62 11	57 50	87 05	38	5	5	1	1
January, 1873	50	3,098 50	61 58	57 45	105 50	38	12	8	1	.....
February, 1873	31	2,051 40	66 10	58 30	82 30	16	15	15	.....	5
March, 1873	50	3,283 13	65 39	60 35	96 35	36	14	14	1	2
April, 1873	53	3,195 19	60 17	58 30	69 30	53	.....	.....	.....	.....
May, 1873	57	3,487 20	61 10	58 00	69 30	57	.....	.....	.....	.....
June, 1873	56	3,368 10	60 28	53 30	69 00	56	.....	.....	.....	.....
July, 1873	56	3,238 10	57 48	53 30	69 30	56	.....	.....	.....	.....
August, 1873	55	3,153 40	57 20	54 00	69 30	55	.....	.....	.....	.....
September, 1873	53	3,053 10	57 36	54 00	69 30	53	.....	.....	.....	.....
Whole period...	548	35,099 02	64 02	53 30	105 50	527	51	45	3	8

18.—*Through mails to New York from Memphis.*

SOUTHWESTERN ROUTE.—From Memphis, Tenn., via Grand Junction, Tenn., Chattanooga, Tenn., Knoxville, Tenn., Bristol, Tenn., Lynchburgh, Va., and Washington, D. C., to New York, N. Y.—1,165 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872.....	31	2,121 30	68 26	66 25	91 20	28	3	1	.....	1
November, 1872.....	30	2,143 10	71 26	67 15	92 35	22	8	3	.....	3
December, 1872.....	31	2,348 15	75 45	67 20	96 30	19	12	8	.....	5
January, 1873.....	31	2,274 45	73 22	67 20	101 40	23	8	6	.....	5
February, 1873.....	27	1,963 55	72 44	67 20	93 40	21	6	5	.....	4
March, 1873.....	31	2,287 05	73 46	67 10	92 40	21	10	7	.....	6
April, 1873.....	30	2,052 05	68 24	67 10	91 30	29	1	1	.....	1
May, 1873.....	31	2,163 05	69 46	67 10	91 30	28	3	3	.....	3
June, 1873.....	32	2,194 45	68 35	61 20	78 20	30	2	.....	.....	.....
July, 1873.....	42	2,870 30	68 20	60 40	92 15	37	5	5	.....	1
August, 1873.....	31	2,160 10	69 40	68 30	78 30	29	2	.....	.....	.....
September, 1873.....	32	2,226 20	69 34	61 30	79 00	29	3	.....	.....	.....
Whole period...	379	26,808 35	70 44	60 40	101 40	316	63	39	.....	29

WESTERN ROUTE.—From Memphis, Tenn., via Humboldt, Tenn., Bowling Green, Ky., Louisville, Ky., Cincinnati, Ohio, Columbus, Ohio, Pittsburgh, Pa., and Harrisburgh, Pa., to New York, N. Y.—1,229 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872.....	58	3,722 15	64 10	49 30	78 45	38	20	6	.....	2
November, 1872.....	52	3,194 00	61 25	52 45	76 55	31	21	20	.....	4
December, 1872.....	56	3,955 15	70 37	53 00	94 00	13	43	29	.....	5
January, 1873.....	54	3,804 20	70 27	56 00	91 00	6	48	29	2	.....
February, 1873.....	51	3,838 20	75 15	59 30	107 30	10	41	29	2	4
March, 1873.....	57	4,348 25	76 17	59 00	104 00	15	42	42	.....	.....
April, 1873.....	56	3,561 05	63 35	53 25	77 15	46	10	10	.....	.....
May, 1873.....	59	3,616 35	61 17	52 00	76 15	31	28	7	.....	2
June, 1873.....	56	3,652 45	65 13	51 40	96 00	25	31	16	1	3
July, 1873.....	43	2,632 15	61 12	52 10	92 30	24	19	16	1	7
August, 1873.....	55	3,186 35	57 56	52 10	75 00	42	13	6	.....	1
September, 1873.....	54	3,227 25	59 46	52 25	76 15	36	18	14	.....	1
Whole period...	651	42,739 15	65 39	51 40	107 30	317	334	224	6	29

19.—*Through mails to Cincinnati from Washington.*

ROUTE.—From Washington, D. C., via Cumberland, Md., Grafton, W. Va., and Parkersburgh, W. Va., to Cincinnati, Ohio—612 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872.....	58	1,511 55	26 04	23 00	38 05	48	10	1	.....	.....
November, 1872	55	1,463 55	26 37	25 00	37 45	50	5	1	.....	1
December, 1872	56	1,581 35	28 14	24 50	42 50	45	11	2	.....	4
January, 1873	58	1,582 45	27 17	25 00	52 00	54	4	1	2	.....
February, 1873	51	1,426 15	27 57	25 00	49 20	42	9	2	1	.....
March, 1873	57	1,535 40	26 56	24 00	34 30	49	8	.....	.....	1
April, 1873	56	1,458 40	26 02	25 00	33 00	54	2	.....	.....	.....
May, 1873	60	1,615 45	26 55	22 40	53 00	50	10	3	.....	1
June, 1873.....	59	1,438 30	24 22	20 55	67 00	56	3	2	1	2
July, 1873	74	1,957 30	26 27	22 35	48 05	62	12	8	2	3
August, 1873	56	1,473 55	26 19	22 35	46 35	40	16	6	1	1
September, 1873.....	54	1,346 40	24 56	22 35	43 25	50	4	1	1	.....
Whole period ...	694	18,393 05	26 30	20 55	67 00	600	94	27	8	13

20.—*Through mails to Washington from Cincinnati.*

ROUTE.—From Cincinnati, Ohio, via Parkersburgh, W. Va., Grafton, W. Va., and Cumberland, Md., to Washington, D. C.—612 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872.....	51	1,348 55	26 26	20 00	38 45	38	13	2	.....	2
November, 1872	53	1,507 25	28 26	21 30	47 30	38	15	3	.....	1
December, 1872	47	1,423 20	30 17	20 40	48 45	31	16	9	.....	3
January, 1873	55	1,532 00	27 51	21 05	38 05	44	11	5	.....	2
February, 1873	46	1,373 15	29 51	24 45	43 50	29	17	4	.....	2
March, 1873	53	1,524 35	28 45	21 20	49 30	40	13	6	2	2
April, 1873	51	1,366 35	26 47	24 45	33 10	46	5	.....	.....	.....
May, 1873	57	1,541 05	27 02	21 10	37 55	49	8	2	.....	.....
June, 1873.....	59	1,520 15	25 46	22 30	48 40	51	8	4	1	.....
July, 1873	83	2,118 50	23 07	22 30	47 00	69	14	7	.....	1
August, 1873	85	2,184 55	25 42	22 30	52 40	67	18	1	2	.....
September, 1873.....	78	1,907 10	24 27	22 25	32 50	76	2	.....	.....	.....
Whole period ...	718	19,348 20	26 56	20 00	52 40	578	140	43	5	13

21.—*Through mails to Cincinnati from New York.*

ROUTE.—From New York, N. Y., via Harrisburgh, Pa., Pittsburgh, Pa., Steubenville, Ohio, Columbus Ohio, and Xenia, Ohio, to Cincinnati, Ohio—744 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	55	1,819 30	33 05	28 00	55 35	40	15	6	.....	2
November, 1872	54	1,772 55	32 49	28 15	42 30	24	30	4	.....	2
December, 1872	52	2,088 50	40 10	29 00	79 00	21	31	16	.....	3
January, 1873	55	2,521 10	45 50	31 30	77 00	20	35	19	2	5
February, 1873	50	2,291 45	45 50	31 05	74 00	18	32	16	5	4
March, 1873	53	2,010 05	37 55	29 00	61 00	39	14	7	.....	2
April, 1873	57	2,052 40	36 00	29 20	71 10	24	33	9	2	2
May, 1873	70	2,338 25	33 24	26 20	74 20	50	20	6	1	1
June, 1873	74	2.455 30	33 10	28 50	46 00	56	18	8	.....	1
July, 1873	76	2,476 40	32 35	27 50	45 20	69	7	.....	.....	1
August, 1873	78	2,558 00	32 47	28 20	62 00	63	15	7	1	.....
September, 1873	78	2,794 10	35 49	28 50	74 30	53	25	12	6	1
Whole period...	752	27,179 40	36 08	26 20	79 00	477	275	110	17	24

22.—*Through mails to New York from Cincinnati.*

ROUTE.—From Cincinnati, Ohio, via Xenia, Ohio, Columbus, Ohio, Steubenville, Ohio, Pittsburgh, Pa., and Harrisburgh, Pa., to New York, N. Y.—744 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	64	2,129 20	33 16	24 10	41 20	54	10	3	.....	1
November, 1872	60	2,060 50	34 20	26 30	48 45	47	13	1	.....	.....
December, 1872	60	2,403 00	40 03	21 00	82 20	31	29	13	6	3
January, 1873	63	2,550 55	40 39	30 30	64 55	38	25	3	2	1
February, 1873	42	1,774 15	42 14	30 00	60 15	14	28	4	.....	6
March, 1873	59	2,192 40	37 09	28 25	47 00	43	16	2	1	1
April, 1873	63	2,116 55	32 00	24 25	56 35	52	11	5	1	.....
May, 1873	64	2,110 00	32 58	25 20	42 25	55	9	1	.....	.....
June, 1873	56	1,891 10	32 09	29 45	47 00	48	8	3	.....	.....
July, 1873	66	2,200 25	33 20	27 30	46 15	59	7	3	1	.....
August, 1873	82	2,772 45	33 48	29 10	58 35	72	10	6	.....	1
September, 1873	75	2,543 40	33 55	26 00	56 45	65	10	4	.....	1
Whole period...	754	26,745 55	35 28	21 00	82 20	578	176	48	11	14

23.—*Through mails to Saint Louis from Washington.*

ROUTE.—From Washington, via Cumberland, Md., Grafton, W. Va., Parkersburgh, W. Va., and Cincinnati, Ohio, to Saint Louis, Mo.—954 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	55	2,492 00	45 18	40 30	70 45	33	22	6	1	.....
November, 1872	51	2,373 45	46 32	40 15	65 00	32	19	9	.....	1
December, 1872	55	2,811 30	51 07	40 30	65 00	38	17	16	.....	3
January, 1873	57	2,595 30	45 32	40 00	71 45	32	25	8	2	.....
February, 1873	53	2,482 45	46 50	39 30	72 45	22	31	6	1	.....
March, 1873	57	2,651 45	46 31	35 30	65 00	23	34	9	2	1
April, 1873	58	2,947 15	50 48	40 30	227 30	30	28	15	4	2
May, 1873	58	2,672 30	46 07	40 10	73 15	39	19	8	1	2
June, 1873	64	2,815 55	43 59	36 30	81 40	50	14	7	3	.....
July, 1873	77	3,533 45	45 53	38 00	68 30	32	45	14	3	.....
August, 1873	56	2,440 45	43 35	34 05	71 50	28	28	6	.....	1
September, 1873	53	2,316 15	43 42	37 20	81 35	30	23	6	.....	.....
Whole period...	694	32,130 40	46 17	34 05	227 30	389	305	110	17	10

24.—*Through mails to Washington from Saint Louis.*

ROUTE.—From Saint Louis, Mo., via Cincinnati, Ohio, Parkersburgh, W. Va., Grafton, W. Va., and Cumberland, Md., to Washington, D. C.—954 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	57	2,665 50	46 46	35 55	100 20	27	30	12	1	5
November, 1872	55	2,651 00	48 12	36 45	68 20	24	31	12	1	1
December, 1872	57	2,930 45	51 25	41 20	74 10	29	28	15	1	1
January, 1873	57	3,005 15	52 43	41 20	85 20	19	38	23	.....	3
February, 1873	53	2,852 10	53 48	41 20	78 40	19	34	23	.....	1
March, 1873	58	2,759 55	47 35	37 55	76 20	34	24	10	1	1
April, 1873	56	2,567 50	45 51	41 20	65 20	41	15	4	.....	.....
May, 1873	58	2,576 00	44 25	37 45	54 30	46	12	1	.....	.....
June, 1873	53	2,226 30	42 00	38 10	52 00	41	12	8	.....	.....
July, 1873	56	2,375 40	42 25	37 45	65 00	33	23	5	2	.....
August, 1873	48	1,948 30	40 35	37 50	49 15	37	11	2	.....	1
September, 1873	30	1,200 35	40 01	38 05	43 30	25	5	.....	.....	.....
Whole period...	638	29,760 00	46 38	35 55	100 20	375	263	115	6	13

25.—*Through mails to Saint Louis from New York.*

ROUTE.—From New York, N. Y., via Harrisburgh, Pa., Pittsburgh, Pa., Steubenville, Ohio, Columbus, Ohio, Indianapolis, Ind., Terre Haute, Ind., and Mattoon, Ill., (also, after passing Terre Haute, via Vandalia, Ill.,) to Saint Louis, Mo.—1,074 miles, (1,050 miles via Vandalia.)

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	57	2,976 15	52 12	43 00	76 00	28	29	15	3	3
November, 1872	49	2,649 00	54 03	46 00	73 30	28	21	17	1	3
December, 1872	53	3,279 15	61 52	43 00	99 30	19	34	30	4	2
January, 1873	51	3,158 00	61 55	43 00	85 30	21	30	25	4	2
February, 1873	49	3,071 30	62 30	43 00	91 00	15	34	29	5	3
March, 1873	50	2,954 30	59 05	46 30	91 00	8	42	29	2	3
April, 1873	51	2,981 00	58 29	43 00	100 30	19	32	27	4	2
May, 1873	65	3,369 15	51 50	42 00	76 00	39	26	20	3	2
June, 1873	79	3,913 15	49 32	42 00	74 00	56	23	9	8	1
July, 1873	78	3,688 40	47 17	41 00	71 30	53	25	8	4	2
August, 1873	82	3,996 25	48 44	43 30	71 30	62	20	6	8	.....
September, 1873	80	4,004 00	50 03	41 00	82 00	51	29	13	7	.....
Whole period...	744	40,041 05	53 49	41 00	100 30	399	345	228	53	23

26.—*Through mails to New York from Saint Louis.*

ROUTE.—From Saint Louis, Mo., via Mattoon, Ill., (also via Vandalia, Ill.,) Terre Haute, Ind., Indianapolis, Ind., Columbus, Ohio, Steubenville, Ohio, Pittsburgh, Pa., and Harrisburgh, Pa., to New York, N. Y.—1,074 miles, (1,050 miles via Vandalia.)

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	76	3,847 45	50 37	40 15	73 45	50	26	12	1	.....
November, 1872	75	3,830 00	51 04	43 20	82 10	48	27	8	1	1
December, 1872	73	4,242 35	58 07	43 30	91 50	36	37	21	4	3
January, 1873	76	4,483 25	58 59	44 15	94 30	22	54	23	5	.....
February, 1873	67	3,737 25	55 46	43 30	75 00	15	52	20	5	.....
March, 1873	80	4,355 45	54 26	44 30	94 30	28	52	28	7	.....
April, 1873	76	3,941 05	51 51	42 15	66 15	44	32	13	4	.....
May, 1873	80	4,000 25	50 00	43 45	74 00	63	17	7	2	.....
June, 1873	73	3,647 20	49 57	43 15	68 30	55	18	12	2	.....
July, 1873	75	3,567 25	47 33	41 20	69 45	64	11	3	2	.....
August, 1873	44	2,035 05	46 15	41 10	71 30	36	8	4	.....	1
September, 1873	33	1,511 55	45 48	41 45	67 15	20	13	1	.....	1
Whole period...	828	43,200 10	52 10	40 15	94 30	481	347	152	33	6

27.—*Through mails to Chicago from Washington.*

ROUTE.—From Washington, D. C., via Baltimore, Md., Harrisburgh, Pa., and Pittsburgh, Pa., (till August 31, 1873, and afterward from Washington, D. C., via Parkersburgh, W. Va., and Cincinnati, O.,) to Chicago, Ill.—841 miles, (873 miles via Parkersburgh.)

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872.....	58	2,129 45	36 43	35 15	40 35	57	1	.....	.....	.....
November, 1872	56	2,091 20	37 20	35 00	40 10	55	1	.....	.....	.....
December, 1872	55	2,170 30	39 27	35 00	62 45	44	11	4	.....	.....
January, 1873	54	2,311 25	42 48	37 35	63 50	33	21	4	.....	1
February, 1873	51	2,162 45	42 45	35 50	53 30	28	23	1	.....	1
March, 1873	55	2,217 35	40 19	35 45	66 35	46	9	1	.....	1
April, 1873	54	2,056 55	38 05	36 10	46 00	50	4	1	.....	.....
May, 1873	57	2,159 05	37 52	36 30	50 30	54	3	1	.....	.....
June, 1873.....	55	2,070 25	37 38	36 30	50 25	51	4	1	.....	.....
July, 1873	58	2,050 10	35 20	32 35	38 55	58	.....	.....	.....	.....
August, 1873	39	1,397 25	35 49	32 45	39 10	38	1	.....	.....	2
September, 1873.....	31	1,419 10	45 46	33 15	61 20	8	23	23	.....	4
Whole period ...	623	24,236 30	38 50	32 35	66 35	522	101	36	.....	9

28.—*Through mails to Washington from Chicago.*

ROUTE.—From Chicago, Ill., via Pittsburgh, Pa., Harrisburgh, Pa., and Baltimore, Md,, (till August 31, 1873, and afterward from Chicago, Ill., via Cincinnati, O., and Parkersburgh, W. Va.,) to Washington, D. C.—841 miles, (873 miles via Parkersburgh.)

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872.....	78	3,087 20	39 34	32 55	61 45	61	17	11	1	2
November, 1872.....	77	3,140 35	40 47	33 00	73 10	48	29	14	1	.....
December, 1872	75	3,138 35	41 50	32 50	62 30	38	37	8	.....	1
January, 1873	81	3,594 50	44 22	37 20	73 30	13	68	24	1	.....
February, 1873	72	3,354 25	46 35	37 20	62 00	7	65	19	.....	1
March, 1873	80	3,510 10	43 52	33 15	58 45	27	53	15	1	.....
April, 1873	76	2,982 05	39 14	29 05	50 30	47	29	7	.....	.....
May, 1873	80	3,079 25	38 29	32 30	57 45	63	17	5	1	.....
June, 1873.....	76	2,927 40	38 31	33 00	61 45	61	15	7	1	.....
July, 1873	77	2,718 05	35 18	31 50	61 45	57	20	9	.....	1
August, 1873	81	3,294 25	40 40	31 50	61 25	43	38	16	1	.....
September, 1873.....	75	3,026 15	40 21	32 40	59 50	39	36	6	1	.....
Whole period ...	928	38,553 50	41 32	29 05	73 30	504	424	141	8	5

29.—*Through mails to Chicago from New York.*

ROUTE.—From New York, N. Y., via Harrisburgh, Pa., and Pittsburgh, Pa., (also from New York, N. Y., via Erie, Pa.,) to Chicago, Ill.—901 miles, (964 miles via Erie.)

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	58	2,114 00	36 26	34 30	39 25	57	1	.....	.....	.....
November, 1872	56	2,080 55	37 09	35 10	40 45	54	2	.....	.....	.....
December, 1872	57	2,184 40	38 19	35 00	49 00	45	12	1	.....	.....
January, 1873	50	2,080 15	41 36	35 25	52 40	20	30	7	.....	19
February, 1873	49	2,106 10	42 58	36 45	52 45	19	30	7	.....	22
March, 1873	53	2,095 20	39 32	35 10	48 00	31	22	1	.....	2
April, 1873	60	2,222 45	37 02	35 10	49 30	54	6	1	.....	1
May, 1873	68	2,419 30	35 34	34 55	48 15	58	10	2	.....	10
June, 1873	79	2,900 30	36 42	34 55	48 10	76	3	1	.....	6
July, 1873	81	2,984 50	36 50	34 45	39 40	81	.....	.....	.....	.....
August, 1873	83	3,015 35	36 19	34 50	39 55	83	.....	.....	.....	4
September, 1873	79	2,935 30	37 09	35 00	43 00	78	1	.....	.....	5
Whole period ...	773	29,140 00	37 41	34 30	52 45	656	117	20	.....	69

30.—*Through mails to New York from Chicago.*

ROUTE.—From Chicago, Ill., via Pittsburgh, Pa., and Harrisburgh, Pa., (also from Chicago, Ill., via Erie, Pa.,) to New York, N. Y.—901 miles, (964 miles via Erie.)

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	78	3,021 50	38 44	32 50	49 40	68	10	4	.....	.....
November, 1872	74	2,936 35	39 41	32 40	57 30	60	14	4	.....	.....
December, 1872	73	3,167 15	43 23	33 30	70 00	37	36	9	2	1
January, 1873	78	3,650 20	46 47	37 00	70 25	15	63	10	4	.....
February, 1873	71	3,281 20	46 12	38 30	60 15	13	58	6	1	1
March, 1873	79	3,464 00	43 50	34 45	62 00	35	44	5	.....	.....
April, 1873	74	2,967 55	40 06	31 10	52 15	51	23	7	.....	.....
May, 1873	81	3,157 50	38 59	33 55	45 30	81	.....	.....	.....	.....
June, 1873	74	2,916 25	39 24	33 50	57 30	63	11	6	.....	.....
July, 1873	74	2,882 30	38 57	32 00	61 15	62	12	5	2	.....
August, 1873	78	3,006 40	38 32	33 55	57 30	74	4	.....	.....	.....
September, 1873	73	2,891 10	39 30	33 55	60 45	57	16	8	.....	.....
Whole period...	907	37,343 50	41 10	31 10	70 25	616	291	64	9	2

31.—*Through mails to Chicago from Boston.*

ROUTE.—From Boston, Mass., via Albany, N. Y., Buffalo, N. Y., Erie, Pa., and Toledo, Ohio, to Chicago, Ill.—1,042 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	80	3,591 50	44 53	38 45	61 10	80	.....	.....	.....	.....
November, 1872*	20	903 30	45 10	39 40	61 00	20	.....	.....	.....	.....
December, 1872*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
January, 1873*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February, 1873	56	2,643 30	47 12	39 45	67 20	50	6	.....	.....	.....
March, 1873	79	3,656 55	46 17	39 30	60 45	62	17	9	.....	.....
April, 1873	76	3,474 55	45 43	39 00	60 45	72	4	.....	.....	.....
May, 1873	81	3,629 25	44 48	39 10	60 00	81	.....	.....	.....	.....
June, 1873	80	3,606 30	45 04	39 20	59 45	80	.....	.....	.....	.....
July, 1873	85	3,810 00	44 49	39 20	60 00	85	.....	.....	.....	.....
August, 1873	83	3,714 45	44 45	39 20	59 45	81	2	.....	.....	.....
September, 1873	79	3,653 00	46 14	39 15	63 25	77	2	.....	.....	.....
Whole period...	719	32,684 20	45 27	38 45	67 20	688	31	9	.....	.....

* Returns interrupted; great fire at Boston.

32.—*Through mails to Boston from Chicago.*

ROUTE.—From Chicago, Ill., via Toledo, Ohio, Erie, Pa., Buffalo, N. Y., and Albany, N. Y., to Boston Mass.—1,042 miles.

TIME IN TRANSIT.

Period.	Mails carried through.	Aggregate time occupied.	Average time.	Shortest time.	Longest time.	Mails in schedule time.	Mails behind schedule time.	Mails half a day or more behind time.	Mails behind others of later date.	Days on which no mail arrived.
		h. *m.*	*h.* *m.*	*h.* *m.*	*h.* *m.*					
October, 1872	79	3,430 15	43 25	38 30	56 30	79	.....	.....	.....	.....
November, 1872	76	3,381 15	44 29	39 15	58 00	68	8	7	.....	.....
December, 1872	77	3,695 15	47 59	38 30	138 15	57	20	6	1	.....
January, 1873	80	4,080 30	51 00	39 45	85 15	45	35	20	3	.....
February, 1873	72	3,456 40	48 00	39 00	67 00	54	18	5	.....	1
March, 1873	79	3,610 30	45 42	37 15	61 45	40	39	11	.....	.....
April, 1873	72	3,262 30	45 18	39 00	78 45	46	26	9	1	1
May, 1873	81	3,527 00	43 32	38 30	56 00	74	7	1	.....	.....
June, 1873	76	3,256 55	42 46	39 15	59 45	76	.....	.....	.....	.....
July, 1873	77	3,353 45	43 33	38 45	62 15	69	8	5	1	.....
August, 1873	77	3,285 45	42 40	34 00	56 00	77	.....	.....	.....	.....
September, 1873	76	3,303 30	43 28	39 15	59 45	76	.....	.....	.....	.....
Whole period...	922	41,643 50	45 10	34 00	138 15	761	161	64	6	2

JOHN L. ROUTT,
Second Assistant Postmaster-General.

Statements showing operations and results of foreign mail-service for the fiscal year ended June 30, 1873.

The postages on United States and European mails were as follows:

The aggregate amount of postage (sea, inland, and foreign) on the mails exchanged:

With the United Kingdom	$770,931 28
With the North German Union	477,196 38
With France	17,342 50
With Belgium	14,622 86
With Netherlands	22,112 39
With Switzerland	36,926 81
With Italy	37,430 15
With Denmark	29,815 95
With Norway	103 08
With Spain	26 10
Total postages	1,406,507 50

Being an increase of $102,653.45 over the amount reported for the previous year.

The postages on mails sent to Europe were as follows, viz:

To United Kingdom	$402,877 12
To North German Union	243,457 24
To France	6,899 90
To Belgium	7,704 48
To Netherlands	12,075 48
To Switzerland	17,708 00
To Italy	15,333 10
To Denmark	8,567 52
To Norway	62 10
To Spain	26 10
Total	714,711 04

The postages on mails received from Europe were as follows, viz:

From United Kingdom	$368,054 16
From North German Union	233,739 14
From France	10,442 60
From Belgium	6,918 38
From Netherlands	10,036 91
From Switzerland	19,218 81
From Italy	22,097 05
From Denmark	21,248 43
From Norway	40 98
Total	691,796 46
Postages collected in the United States	865,511 47
Postages collected in Europe	540,996 03
Excess of collections in the United States	324,515 44
Number of letters (single rates) sent from the United States	10,273,711
Number of letters (single rates) received from Europe	9,311,803
Total	19,585,514

Being an increase of 1,902,515 over the number reported for the previous year.

The excess of postages on mails sent from the United States to differ-

ent countries of Europe over that on mails received from the same countries was as follows:

United Kingdom	$34,822 96
Germany	9,718 10
Netherlands	2,038 57
Belgium	786 10
Spain	26 10
Norway	21 12
Total	47,412 95

The excess of postages on mails received over those on mails sent was as follows:

With France	$3,522 70
Italy	6,763 95
Switzerland	1,510 81
Denmark	12,680 91
Total	24,478 37

Number of letters and amounts of postage on mails conveyed to and from Europe by the respective steamship-lines.

Name of line.	Number of letters.			Amounts of postage on letter-mails.		
	Sent.	Received.	Total.	Sent.	Received.	Total.
North German Lloyd	1,800,379	2,431,210	4,231,589	$129,090 52	$186,578 48	$315,669 00
Hamburg line	2,765,366	1,185,424	3,950,790	192,424 99	91,166 50	283,591 49
Cunard line	223,393	3,246,489	3,469,882	15,238 23	230,661 24	245,899 47
Williams & Guion line	3,399,620	285	3,399,905	236,728 38	26 04	236,754 42
Inman line	554,646	2,370,314	2,924,960	39,559 28	175,843 71	215,402 99
White Star line	1,233,870	6,035	1,239,905	82,338 32	441 00	82,779 32
Canadian line	253,577	2,135	255,712	15,703 22	129 08	15,832 30
French line	26,007	64,457	90,464	2,600 70	6,447 70	9,048 40
National line	15,564	.....	15,564	944 88	.....	944 88
Baltic-Lloyd line	1,167	3,626	4,793	70 32	348 23	418 55
Transient steamers	.....	1,096	1,096	.....	108 60	108 60
Norwegian steamers	.....	683	683	.....	40 98	40 98
Red Star line	122	49	171	12 20	4 90	17 10
Total	10,273,711	9,311,803	19,585,514	714,711 04	691,796 46	1,406,507 50
Increase over 1872	859,585	1,042,930	1,902,515	52,395 85	50,257 60	102,652 85

Payments during fiscal year ended June 30, 1873, to ocean steamship lines transporting mails for the sea postages as compensation for the service.

Williams and Guion line		$79,294 42
Hamburg line		57,958 88
North German Lloyd line		33,573 74
White Star line		29,831 97
Inman line		14,641 70
Cunard line		4,977 37
Canadian line		6,065 13
National line		390 49
Baltic Lloyd line		12 07
		226,745 77
To Pacific Mail Steamship Company	$27,731 56	
To West Indies, Mexico, Brazil, Bermuda, New Granada, and New Zealand	65,145 94	
To Nova Scotia	2,648 08	
		95,525 58
Total		322,271 35

Weight of correspondence exchanged during the fiscal year ended June 30, 1873, between the United States and countries of Europe with which the United States have concluded postal conventions.

Countries.	LETTER MAILS.						PRINTED MATTER AND SAMPLES.						Total weight of mails exchanged with European countries.	
	From the United States.		To the United States.		Total.		From the United States.		To the United States.		Total.			
	Grams.	Ounces.	Grams.	Ounces.	Grams.	Ounces.	Grams.	Ounces.	Grams.	Ounces.	Grams.	Ounces.	Grams.	Ounces.
United Kingdom		1,989,978½		1,816,862½		3,806,840¾		7,631,575½		10,617,428		18,249,003½		22,055,844¼
Germany	32,888,366		25,678,105		58,566,471		70,300,257		24,032,048		94,332,305		152,898,776	
France	747,161		802,792		1,549,953		11,437,758		965,345		12,403,103		13,953,056	
Belgium	683,877		556,860		1,240,737		2,008,524		1,932,551		3,941,075		5,181,812	
Netherlands	1,250,561		819,165		2,069,726		1,877,979		1,263,668		3,141,647		5,211,373	
Switzerland	1,578,301		1,478,771		3,057,072		5,547,992		3,158,821		8,706,813		11,763,885	
Italy	1,307,077		1,404,410		2,711,487		3,833,721		2,047,352		5,881,073		8,592,560	
Denmark	1,082,693		1,969,566		3,052,259		555,167		1,276,416		1,831,583		4,883,842	
Norway and Sweden	9,994		6,800		16,794		87,748		6,075		93,823		110,617	
Spain	2,088				2,088								2,088	
Total grams and equivalents in ounces	39,550,118	1,395,886 44/85	32,716,469	1,154,698 77/85	72,266,587	2,550,585 36/85	95,649,146	3,375,852 18/85	34,682,276	1,224,080 28/85	130,331,422	4,599,932 46/85	202,598,009	7,150,517 82/85
Total		3,385,865 3/170		2,971,561 53/340		6,357,426 59/340		11,007,427 181/170		11,841,508 28/85		22,848,936 7/170		29,206,362 73/340
Increase over 1872		406,889 46/170		320,058 272/340		726,948 24/340		962,573 29/170		1,265,812 55/340		2,228,385 113/340		2,955,333 137/340

Number of letters and newspapers and amounts of United States postage (so far as reported) on mails exchanged with Canada, the West India Islands, &c.

Country.	Number of letters.	Number of newspapers.	United States postage.
British provinces. (incomplete)	6,359,154	1,657,994	$222,120 27
West India Islands	838,206	318,704	96,972 47
Panama and Central America	227,496	213,448	34,264 32
China and Japan	216,525	272,416	28,269 82
Brazil	89,456	88,994	12,256 84
Sandwich Islands, New Zealand, and Australia	85,709	144,114	9,302 72
Mexico	43,178	49,909	4,139 51
Ecuador	5,753	6,977	1,277 94
New Granada	6,893	1,961	728 52
Venezuela	1,002	102	102 24
Belize, (Honduras)	299	No report.	32 68
Total	7,873,671	2,754,619	409,467 33

CONTRACT FOR ADDITIONAL MAIL-SERVICE BETWEEN THE UNITED STATES AND JAPAN AND CHINA.

This article of contract, made the twenty-third day of August, in the year of our Lord one thousand eight hundred and seventy-three, between the United States of America, (acting in this behalf by their Postmaster-General,) and the Pacific Mail Steamship Company, with George H. Bradbury and Rufus Hatch, esquires, as sureties, witnesseth:

That whereas the said Pacific Mail Steamship Company were heretofore accepted in accordance with the stipulations and provisions of sections 3 and 6 of the act of Congress approved June 1, 1872, entitled "An act making appropriations for the service of the Post-Office Department for the year ending June 30, 1873," and in conformity with the advertisement inviting proposals for said service issued by the Postmaster-General of the United States on the 5th day of June, 1872, as contractors for the conveyance of an additional monthly mail on the mail-steamship route between the port of San Francisco and the port of Hong-Kong, China, via Yokohama, Japan, with a regular branch line, running in connection with the main line, between Yokohama and Shanghai, China, at the sum of five hundred thousand dollars for the performance of twelve round trips per annum for a term of ten years, from and after the first day of October, eighteen hundred and seventy-three, and upon the same conditions and limitations as prescribed by existing acts of Congress in reference thereto, and the respective contracts made in pursuance thereof;

And whereas the said Pacific Mail Steamship Company on the 29th day of August, 1872, entered into articles of contract with the United States of America, acting in that behalf by their Postmaster-General, for the conveyance of the said mails, in conformity with the provisions and stipulations of the said act of Congress, with Alden B. Stockwell and Henry Clews, esquires, as its sureties in the said contract;

And whereas the said Pacific Mail Steamship Company have desired to procure the discharge and release of the said Stockwell and Clews as the sureties for the company under said contracts, and have offered to substitute therefor George H. Bradbury, of Englewood, N. J., and Rufus Hatch, of the city of New York, esquires, as sureties in their stead;

And whereas the United States, acting by their Postmaster-General in this behalf, have consented and agreed with the said company to accept and receive the said George H. Bradbury and Rufus Hatch as sureties for the performance and service to be rendered by the said steamship company under said contracts, in lieu of said Stockwell and Clews as

sureties therefor and thereunder, and to that end to accept and receive a new contract upon the part of said steamship company, with the said George H. Bradbury and Rufus Hatch as sureties, for the performance of the service provided for by said first-named contracts, respectively, and with the like stipulations and conditions:

Now, therefore, these presents witnesseth that the said Pacific Mail Steamship Company, contractors, and the said George H. Bradbury and Rufus Hatch as sureties, do jointly and severally undertake, covenant, and agree with the United States, and do bind themselves to transport the mails of the United States between the ports of San Francisco and Hong-Kong, in China, touching at Yokohama, Japan, both on the outward and inward passages, to land and receive mails, with a regular connecting branch line of steamers between Yokohama and Shanghai, China, twelve round trips per annum, by an additional monthly line of first-class American steamships, to conform in all respects to the requirements and provisions of the third section of the act of Congress above cited, approved June 1, 1872, and the advertisement of the Postmaster-General, issued in accordance therewith, dated June 5, 1872, and of sufficient number to perform the required additional monthly service for and during the term of ten years, commencing on the first of October, eighteen hundred and seventy-three. And the said contractors do further covenant and agree with the United States, and do bind themselves, that the steamships hereafter offered for the service shall be of not less than four thousand tons register each, and shall be built of iron, and with their engines and machinery shall be wholly of American construction, of the best materials, and after approved models, and shall be so constructed as to be readily adapted to the armed naval service of the United States in case of war; and before acceptance the officers by whom they are inspected shall report to the Secretary of the Navy and the Postmaster-General whether this condition has been complied with; and further, that the said steamships, after acceptance by the Postmaster-General and during the period they may be employed in conveying the mails, shall be kept up by alterations, repairs, and additions, as the exigency may require, fully equal to the best state of steamship improvement attained, and if not so kept up and maintained they may be rejected by the Postmaster-General of the United States as not meeting the requirements of the act of Congress authorizing the additional monthly service, and other satisfactory steamships required in their place. And the said contractors do further covenant and agree, and do bind themselves, to carry the United States mails during the existence of their contracts, without additional charge, on all the steamers they may run upon said line or any part of it, or any branch or extension thereof; and they do further covenant and agree to transport, free of expense, on each and every steamer, a mail-agent of the United States, to take charge of and arrange the mail-matter, and to assign to such agent a separate state-room on the upper or main deck, with suitable accommodations for that purpose; and it is further covenanted and agreed by the said contractors, and they do bind themselves—

First, to dispatch an additional steamship from San Francisco on the sixteenth day of each month, and from Hong-Kong on the twenty-seventh of each month, or upon such other days as may be hereafter selected, with the approval of the Postmaster-General, the departures to be always so arranged as to alternate at equal and regular intervals with those of the present monthly line during its continuance, and to form in connection therewith a regular semi-monthly mail-service between San Francisco and Hong-Kong via Yokohama.

Second, that the time occupied in making each passage between San Francisco and Hong-Kong shall not exceed thirty-two days in summer and thirty-five days in winter, including detention at Yokohama, which is not to exceed two days on the outward and three days on the inward voyage; and the time occupied in making each passage on the branch line between Yokohama and Shanghai shall not exceed eight days, including detention at Hiogo and Nagasaki, which is not to exceed twenty-four hours at each port; and further, to perform the service in conformity with such schedule of days and hours of departures and arrivals as shall be approved by the Postmaster-General of the United States.

Third, to transport the mails in a safe and secure manner, free from wet or other injury, in a separate apartment in each steamship, to be fitted up for the exclusive accommodation of the mail.

Fourth, to take the mail and every part of it from and deliver it and every part of it into the post-offices at San Francisco and Hong-Kong, and the offices of the United States postal agents at Shanghai, (China,) Yokohama, (Japan,) and other Japanese ports of call.

They also undertake, covenant, and agree with the United States, and do bind themselves, to be answerable for the proper care and transportation of the mails and accountable to the United States for any damages which may be sustained by the United States through the unfaithfulness or want of care of their officers, agents, and employés; and they do further covenant and agree that they will not transmit, by themselves or their agents, or be concerned in transmitting, commercial intelligence more rapidly than by mail, and that they will not carry, or suffer to be carried, letters or newspapers out of the mail, and they will not knowingly convey any person carrying on the business of transporting letters or other mail matter without the special consent of the Post-Office Department of the United States; and further, that they will convey, without additional charge, post-office blanks, mail-bags, and the occasional special agent on business of the Post-Office Department exclusively, on the exhibition of his credentials.

For which services, when performed, the said Pacific Mail Steamship Company are to be paid by the United States the sum of five hundred thousand dollars per annum, (being at the rate of forty-one thousand six hundred and sixty-six dollars for each round voyage,) in the currency of the United States, in quarterly payments, on the receipt at the Post-Office Department of satisfactory evidence of the performance of the round voyages embraced in said payments, provided that the moneys payable under this contract shall be paid while the said Pacific Mail Steamship Company or its successors in interest shall maintain and run the line of steamships for the transportation of freight and passengers at present run between New York and San Francisco, via the isthmus of Panama, by the said Pacific Mail Steamship Company, and no longer, said payments, however, to be subject to deductions, fines, and penalties imposed by the Postmaster-General for failures and irregularities as hereinafter stipulated. It is hereby also stipulated and agreed by the said contractors and their sureties that, in case of failure from any cause to perform any of the regular monthly voyages stipulated for in this contract, a pro-rata reduction shall be made from the compensation on account of such omitted voyage or voyages. And it is further stipulated and agreed that suitable fines and penalties shall be imposed, in the discretion of the Postmaster-General, for delays and irregularities in the performance of the service. If delays occur in the arrivals of the steamers according to schedule, the company will be fined in a sum

not exceeding two thousand dollars for every forty-eight hours; and should delays occur in their departure, a fine will be imposed not exceeding one thousand dollars, for every twenty-four hours except in cases of unforeseen and uncontrollable events; and suitable fines shall also be imposed, unless the delinquency shall be satisfactorily explained to the Postmaster-General in due time, for failure to take or deliver the mail or any part of it; for suffering it to be wet, injured, lost, or destroyed; for carrying it in a place or manner that exposes it to depredation, loss, or injury by being wet or otherwise; and for setting up or running an express to transmit letters or commercial intelligence in advance of the mails, or for transmitting knowingly, or after being informed, any one engaged in transporting letters or mail-matter in violation of the laws of the United States. And it is hereby further stipulated and agreed that the Postmaster-General shall have the power to determine this contract at any time in case of its being underlet or assigned to any other party, and that he may annul the contract for repeated failures, for violating the post-office laws of the United States, for disobeying the instructions of the Department, or for transporting persons conveying mail-matter out of the mails as aforesaid; and that this contract shall, in all its parts, be subject to, and in all respects governed by, the requirements and provisions of the third and sixth sections of the act of Congress approved June 1, 1872, entitled "An act making appropriations for the service of the Post-Office Department for the year ending June thirty, eighteen hundred and seventy-three," and also of the act of Congress approved the 21st of April, 1808, entitled "An act concerning public contracts," so far as the provisions of the act last cited shall apply thereto; and it is hereby further stipulated and agreed that this contract may at any time be terminated by Congress.

In witness whereof the said Postmaster-General has caused the seal of the Post-Office Department to be affixed hereto, and has attested the same by his signature; and the said the Pacific Mail Steamship Company, by George H. Bradbury, president, and their sureties, have hereto set their hands and seals the day and year first hereinbefore written.

JNO. A. J. CRESWELL, [SEAL.]
Postmaster-General of the United States.

Signed, sealed, and delivered by the Postmaster-General in presence of—

JOSEPH H. BLACKFAN.

PACIFIC MAIL STEAMSHIP CO., [SEAL.]
By GEO. H. BRADBURY, *President.*
GEO. H. BRADBURY. [SEAL.]

Attest: W. H. LANE, *Sec. pro tem.*

RUFUS HATCH. [SEAL.]

Witness: JENNINGS S. COX.

Signed, sealed, and delivered by the Pacific Mail Steamship Company, by George H. Bradbury, president, and signed by George H. Bradbury and Rufus Hatch in presence of—

HAMILTON FISH, JR.

POST-OFFICE, NEW YORK,
August , 1873.

The undersigned, postmaster at New York, State of New York, certifies, under his oath of office, that he is acquainted with the above guarantors, and knows them to be men of property, and able to make good their guarantee.

T. L. JAMES,
Postmaster at New York.

POSTAL CONVENTION BETWEEN THE UNITED STATES OF AMERICA AND THE EMPIRE OF JAPAN.

The undersigned, being thereunto duly authorized by their respective governments, have agreed upon the following articles establishing and regulating the exchange of correspondence between the United States of America and the empire of Japan :

ARTICLE I.

There shall be an exchange of correspondence between the United States of America and the empire of Japan by means of the direct line of United States mail-packets plying between San Francisco and Japan, as well as by such other means of direct mail-steamship transportation between the United States and Japan, as shall hereafter be established with the approval of the respective post-departments of the two countries, comprising letters, newspapers, printed matter of every kind, and patterns and samples of merchandise, originating in either country and addressed to and deliverable in the other country, as well as of correspondence of the same nature originating in or destined for foreign countries to which the United States and Japan may respectively serve as intermediaries.

ARTICLE II.

The post-office of San Francisco shall be the United States office of exchange, and Yokohama the office of exchange of the empire of Japan, for all mails exchanged between the United States and Japan. The two post-departments, by agreement, may establish additional offices of exchange, whenever it shall be found necessary.

ARTICLE III.

No accounts shall be kept between the post-departments of the two countries upon the international correspondence, written or printed, exchanged between them, but each country shall retain to its own use the postages which it collects at the rates fixed by this convention.

The single rate of international letter-postage shall be fifteen cents in the United States and fifteen sen in Japan on each letter weighing fifteen grammes ($\frac{1}{2}$ ounce) or less, and an additional rate of fifteen cents or fifteen sen for each additional weight of fifteen grammes ($\frac{1}{2}$ ounce) or fraction thereof, which shall, in all cases, be prepaid one single rate by means of postage-stamps of the country of origin at the office of mailing in either country. Letters unpaid or prepaid less than one full rate of postage shall not be forwarded, but insufficiently-paid letters on

which a single rate or more has been prepaid shall be forwarded, charged with the deficient postage, to be collected and retained by the post-department of the country of destination. Letters fully prepaid, received in either country from the other, shall be delivered free of all charge whatsoever.

It is, however, formally agreed that the single rate of international letter-postage shall be reduced to twelve cents in the United States and to twelve sen in Japan, at the expiration of twelve months from the date of carrying this convention into effect.

The United States post-office shall levy and collect, to its own use, on newspapers addressed to or received from Japan, a postage charge of two cents; and on all other articles of printed matter, patterns, and samples of merchandise, addressed to or received from Japan, a postage charge of two cents for each weight of two ounces, or fraction of two ounces.

The post-office of Japan shall levy and collect, to its own use, on newspapers, and other articles of printed matter, patterns, and samples of merchandise addressed to or received from the United States, the regular rates of Japanese domestic postage chargeable thereon by the laws and regulations of the empire of Japan.

Newspapers, and all other kinds of printed matter, patterns, and samples of merchandise, shall be subject to the laws and regulations of each country respectively, prescribing the conditions of their publication and circulation, and also with regard to their liability to be rated with letter-postage when containing written matter, or for any other cause specified in said laws and regulations, as well as in regard to their liability to customs duty under the revenue laws of either country.

ARTICLE IV.

Every international letter insufficiently paid, received in the United States from Japan, shall, in addition to the deficient postage, be subject to a fine of 6 cents, to be retained by the United States post-office; and every international letter insufficiently paid, received in Japan from the United States, shall, in addition to the deficient postage, be subject to a fine of 6 sen, such fine to be retained by the Japanese post-office.

ARTICLE V.

There shall be an exchange of correspondence between the Japanese post-offices of Yokohama, Hioga, and Nagasaki, and the United States postal agency at Shanghai, China, by means of United States or Japanese mail-packets plying regularly on the route between the ports of Japan and Shanghai, comprising letters, newspapers, printed matter of every kind, patterns, and samples of merchandise, originating in Japan, and addressed to Shanghai, or originating in Shanghai and addressed to Japan. The correspondence so forwarded in either direction between Japan and Shanghai, shall give rise to no accounts between the two post-departments, but each shall levy, collect, and retain to its own use the following postage rates on the correspondence which it forwards to the other, the same to be in full of all charges to destination:

On correspondence from Shanghai for Japan, there shall be levied and collected at the United States postal agency at Shanghai a postage of six cents per each single rate of half an ounce or under on letters, two cents each on newspapers and prices-current, and two cents per each weight of two ounces or fraction of two ounces on other articles of printed matter, patterns, or samples of merchandise.

On correspondence from Japan for Shanghai, there shall be levied and collected at the office of mailing in Japan, a postage of six sen per each single rate of fifteen grammes or under on letters, and the established rates of Japanese domestic postage on other articles of printed matter, patterns, or samples of merchandise.

Correspondence not fully prepaid to destination at the rates fixed by this article will not be forwarded.

Article VI.

Each country grants to the other the privilege of transit of closed mails exchanged in either direction between the latter, and any country to which the other may serve as an intermediary, by its usual means of mail transportation, whether on sea or land.

The rates of postage to be paid by the Japanese post-department to the United States Post-Department for the territorial, or territorial and sea transit, of all correspondence in closed mails, sent or received through the United States for or from countries or places beyond, shall be as follows:

1. On closed mails either for or from Mexico, British Columbia, Canada, and other British North American Provinces, when transmitted entirely by land routes, six cents per thirty grammes for letter-mails, and thirty-two cents per kilogramme for all kinds of printed matter, patterns, and samples of merchandise.

2. On closed mails, either for or from British Columbia, or other British North American Provinces, Mexico, Central, and South America, or the West India Islands, when transported to or from the United States by sea, twenty-five cents per thirty grammes for letter-mails, and forty cents per kilogramme for printed matter of all kinds, patterns, and samples.

3. On closed mails, either for or from Great Britain, Germany, and other countries of Europe, the same rates of territorial and sea-postage as those established by the postal conventions between the United States and each of those countries, respectively.

The rates of postage to be paid by the United States post-office to the Japanese post-office for the territorial, or territorial and sea transit, of correspondence in closed mails sent through Japan for transmission to or from countries and places beyond, shall be agreed upon between the two post-departments when the exercise of the privilege is required.

The country which sends or receives closed mails through the other shall render an account of the letters, newspapers, book-packets, and patterns contained in such closed mails.

Article VII.

The two post-departments of the United States and Japan shall establish by agreement and in conformity with the arrangements in force at the time, the conditions upon which the two offices may reciprocally exchange, in open mails, the correspondence originating in or destined for foreign countries to which they may respectively serve as intermediaries.

It is always understood, however, that such correspondence shall only be charged with the rates applicable to direct international correspondence augmented by the postage due to foreign countries or by any other tax for exterior service.

ARTICLE VIII.

The United States post-office shall account to the Japanese post-office for the sum of two cents upon every single-paid letter from foreign countries sent through the United States in ordinary mails and prepaid to destination in Japan.

ARTICLE IX.

All passenger's letters sent back to the United States by passing mail-steamers on the high seas, shall be paid in full at ten cents per single rate, with United States postage-stamps; and all passenger's letters sent back to Japan by passing mail-steamers on the high seas, shall be paid in full at ten sen per single rate, with Japanese postage-stamps.

ARTICLE X.

The sea-postage for the conveyance across the Pacific Ocean of correspondence in open or closed mails exchanged under the provisions of this convention, shall be computed at six cents per ounce or six sen per thirty grammes (net weight) on letter mails, and six cents per pound or six sen per four hundred and eighty grammes (net weight) on other correspondence.

ARTICLE XI.

Letter-bills shall accompany each mail from one country to the other, containing an account of the weight of each class of correspondence, both international and transit; and the accounts arising between the two offices on the different classes of transit correspondence shall be stated, adjusted, and settled quarterly, and the balance found due on such correspondence shall be promptly paid over by the debtor office to the creditor office in such manner as the creditor office may desire.

ARTICLE XII.

So long as the Government of the United States shall maintain, at its own expense, the existing line of semi-monthly mail-steamers between San Francisco and Yokohama, it is mutually agreed that the government of Japan shall defray the entire expenses of the sea-transportation of all correspondence which shall be transmitted in either direction by any other line of mail-steamers plying between the sea-ports of the two countries.

ARTICLE XIII.

When in any port, of either country, a closed mail is transferred from one vessel to another without any expense to the office of the country where the transfer is made, such transfer shall not be subject to any postal charge by one office against the other.

ARTICLE XIV.

Official communications, addressed by the United States post-office to the Japanese post-office, or by the Japanese post-office to the United States post-office, shall not give rise to any account between the two offices.

ARTICLE XV.

The official correspondence between each government and its legation near the other shall be conveyed to its destination free of postage, and with all the precaution which the two governments may find necessary for its inviolability and security.

ARTICLE XVI.

The two post-departments may, by mutual agreement, provide for the transmission of registered articles in the mails exchanged between the two countries.

The register-fee on each registered article shall be ten cents in the United States and fifteen sen in Japan, and the ordinary postage thereon, as well as the register-fee, must always be fully prepaid.

Each office is at liberty to regulate this fee for the registered articles it dispatches.

ARTICLE XVII.

The two post-departments shall settle, by agreement between them, all matters of detail and arrangement required to carry this convention into execution, and may modify the same in like manner, from time to time, as the exigencies of the service may require.

ARTICLE XVIII.

Every fully-prepaid letter, dispatched from one country to the other, shall be plainly stamped with the words, "Paid all," *in red ink*, on the upper right-hand corner of the address, in addition to the date-stamp of the office at which it was posted; and on insufficiently-paid letters the amount of the deficient postage shall be inscribed in "*black ink*."

ARTICLE XIX.

Dead letters, which cannot be delivered, from whatever cause, shall be mutually returned without charge monthly, or as frequently as the regulations of the respective offices will permit.

ARTICLE XX.

In converting Japanese currency into United States currency, or United States currency into Japanese currency, the United States dollar shall be considered the equivalent of the Japanese yen, and the United States cent as the equivalent of the Japanese sen.

ARTICLE XXI.

The United States post-office agrees that upon a notice of six months being given by the Japanese post-office, at any time after the ratification of this convention, the United States postal-agency at Yokohama, and all other United States postal-agencies that are now or that may hereafter be established within the limits of Japan, shall be discontinued.

ARTICLE XXII.

This convention shall go into effect upon the day on which the postal-agencies of the United States in Japan shall be discontinued.

ARTICLE XXIII.

This convention shall be terminable at any time on a notice by either office of one year. It is to be ratified and the ratifications are to be exchanged as soon as possible.

Done in duplicate original at the city of Washington this sixth day of August, in the year of our Lord one thousand eight hundred and seventy three, or the sixth day of the seventh month of the sixth year of Meiji.

JNO. A. J. CRESWELL, [SEAL.]
Postmaster-General of the United States.
SAMRO TAKAKI. [SEAL.]

I hereby approve the aforegoing convention, and in testimony thereof I have caused the seal of the United States to be affixed.

U. S. GRANT.

By the President:
HAMILTON FISH,
Secretary of State.
WASHINGTON, *August* 6, 1873.

SECOND ADDITIONAL CONVENTION TO THE POSTAL CONVENTION OF AUGUST 21, 1867, BETWEEN THE UNITED STATES OF AMERICA AND BELGIUM.

The General Post-Office of the United States and the postal administration of Belgium having recognized the propriety of reducing the rates of postage fixed by the convention of 21st August, 1867, and by the additional convention of 1st March, 1870, the undersigned, duly authorized by their respective governments, have agreed upon the following articles:

ARTICLE 1.

The international single rate upon letters exchanged in direct mails, via Great Britain, between Belgium and the United States, is fixed as follows:

1. At 40 centimes for prepaid letters originating in Belgium.
2. At 8 cents for prepaid letters originating in the United States.

ARTICLE 2.

The international single rate for prepaid letters sent by the direct steamship lines to be established between the two countries, in conformity with article 6 of the convention of 21st August, 1867, is fixed at 30 centimes for letters sent from Belgium, and at 6 cents for letters sent from the United States, of which 10 centimes (2 cents) shall represent the sea-postage.

ARTICLE 3.

When one of the two contracting offices shall consider it advisable to exchange closed mails with a foreign country to which these offices may

respectively serve as intermediaries by the direct packets which the other contracting office shall have established between Belgium and the United States, it shall pay to the other office for the maritime transportation of said mails between Belgian ports and those of the United States, a fixed fee of —

1. 3 cents (15 centimes) per 30 grammes for letters.
2. 10 cents (50 centimes) per kilogramme for other correspondence.

And the same rates of sea-postage are also fixed for the closed mails conveyed by any line of direct mail-steamers between the two countries.

ARTICLE 4.

The present convention shall be considered as additional to those of August 21, 1867, and March 1, 1870, and shall take effect from the date agreed upon by the two administrations.

Done in duplicate and signed in Washington this 9th day of May, 1873.

JNO. A. J. CRESWELL, [L. S.]
Postmaster-General of the United States.
MAURICE DELFOSSE. [L. S.]

I hereby approve the aforegoing convention, and in testimony thereof I have caused the seal of the United States to be affixed.

U. S. GRANT.

By the President:

HAMILTON FISH,
[L. S.] *Secretary of State.*

WASHINGTON, *May* 12, 1873.

POSTAL CONVENTION BETWEEN THE UNITED STATES OF AMERICA AND THE UNITED KINGDOMS OF SWEDEN AND NORWAY.

The undersigned John A. J. Creswell, Postmaster-General of the United States of America, in virtue of the powers vested in him by law, and Oluf Stenersen, Envoy Extraordinary and Minister Plenipotentiary of His Majesty the King of Sweden and Norway, to the United States of America, in the name of his government, and by virtue of the powers which he has formally presented to this effect, have agreed upon the following articles, to wit:

ARTICLE 1.

There shall be an exchange of correspondence between the United States of America, and the United Kingdoms of Sweden and Norway. This exchange of correspondence shall embrace: 1. Letters ordinary and registered; 2. Newspapers, books, prints of all kinds, (comprising maps, plans, engravings, drawings, photographs, lithographs, and all other like productions of mechanical processes, sheets of music, &c.,) and patterns or samples of merchandise, including grains and seeds. Such correspondence shall be exchanged, whether originating in the United States and destined for either of the United Kingdoms, or *vice versa*, or originating in or destined for such foreign countries to which the contracting countries may serve as intermediaries.

ARTICLE 2.

The offices for the exchange of mails shall be, on the part of Sweden: 1. Goteborg; 2. The travelling post-office, No. 1, between Goteborg and Stockholm; 3. The travelling post-office, No. 2, between Malmo and Falköping. On the part of Norway: 1. Christianssand; 2. Christiania; 3. The sea post office on the steamboat-line between Hammerfest and Hamburg, and on the part of the United States: 1. New York; 2. Chicago.

The respective postal administrations are authorized, if circumstances should require it, to discontinue any of the offices designated for the exchange of mails, or to establish others in their place.

ARTICLE 3.

The post-offices of Sweden and Norway shall make their own arrangements for the dispatch of mails to the United States, and in like manner the post-office of the United States shall make arrangements for the dispatch of mails to Sweden and Norway. The mails shall be forwarded by regular routes of communication, and each office shall, at its own cost, pay the expense of the intermediate transportation (sea and territorial) of the mails which it dispatches to the other country. It is agreed that the cost of the international, ocean, and territorial transit of closed mails exchanged, in either direction, between the frontiers of the respective countries, shall be first defrayed by that one of the offices which shall have obtained from the post-offices of the intermediary countries the most favorable terms for such conveyance, and any amount so advanced by one office, for and on account of the other, shall be promptly re-imbursed.

ARTICLE 4.

The standard weight for the single rate of postage shall be:

1. For letters 15 grammes.

2. For all other correspondence mentioned in the second paragraph of the first article, that which each office adopts for the mails which it dispatches to the other, adapted to the regulations prescribed for such correspondence in the dispatching country. Each office shall, however, give notice to the other of the standard weight it adopts, and of any subsequent change thereof.

The rule of progression shall be an additional single rate for each additional single weight or fraction thereof.

The weight stated by the dispatching-office shall always be accepted, except in the case of manifest error.

ARTICLE 5.

The single rate of postage for letter correspondence exchanged in direct mails between either of the United Kingdoms and the United States shall be:

I. By closed mail via England, without regard to the forwarding of the correspondence, whether to or from a Swedish or Norwegian seaport, or through Germany:

1. For letters from Sweden for the United States:

(*a*) When prepaid in Sweden, 36 öre.

(*b*) When paid in the United States, 14 cents.

2. For letters from the United States for Sweden:
   (*a*) When prepaid in the United States, 9 cents.
   (*b*) When paid in Sweden, 56 öre.
3. For letters from Norway for the United States:
   (*a*) When prepaid in Norway, 12 skilling.
   (*b*) When paid in the United States, 15 cents.
4. For letters from the United States for Norway:
   (*a*) When prepaid in the United States, 10 cents.
   (*b*) When paid in Norway, 18 skilling.

II. By direct regular steamship communication between ports in the United Kingdoms, whether the port be Swedish or Norwegian, on the one side, and ports in the United States, on the other side:

1. For letters from Sweden for the United States:
   (*a*) When prepaid in Sweden, 24 öre.
   (*b*) When paid in the United States, 9 cents.
2. For letters from the United States for Sweden:
   (*a*) When prepaid in the United States, 6 cents.
   (*b*) When paid in Sweden, 36 öre.
3. For letters from Norway for the United States:
   (*a*) When prepaid in Norway, 7 skilling.
   (*b*) When paid in the United States, 9 cents.
4. For letters from the United States for Norway:
   (*a*) When prepaid in the United States, 6 cents.
   (*b*) When paid in Norway, 10 skilling.

Insufficiently prepaid letters shall be charged with the postage for unpaid letters, after deducting the prepaid amount.

On all other correspondence mentioned in the second paragraph of the first article the rate shall be, for the mails dispatched by either route, that which the dispatching-office shall adopt, adapted to the regulations prescribed for such correspondence in the dispatching country. But each office shall give notice to the other of the rate it adopts, and of any subsequent change thereof.

ARTICLE 6.

The Atlantic sea-rate, on the correspondence sent in closed mails through England, shall not exceed 6 cents per ounce for letter-mails, and 6 cents per pound for other correspondence; nor shall the charge for the sea conveyance thereof between England and the United Kingdoms exceed 2 cents per single letter-rate, or 6 cents per ounce, net weight, of letter-mails, and 6 cents per pound for other correspondence.

It is also agreed that the entire cost of the sea transportation between the boundaries of the respective countries, by any direct line of steamships adapted to the conveyance of mails and employed by the respective post-offices, shall not exceed two cents for each single letter-rate, or six cents per ounce, net weight, of letter-mails, and six cents per pound of other correspondence.

It is further stipulated that the Atlantic sea-rate, on the correspondence sent in closed mails through Germany, shall not exceed five cents per 30 grammes of letters, and ten cents per kilogramme of other correspondence.

It is also understood and agreed that the Norwegian post-office shall be re-imbursed for the closed mails sent through Germany, which have been forwarded by the direct steamboat line between Christianssand and Hamburg, worked on Norwegian account, by a sum corresponding to

the Swedish and Danish rate of transit for closed mails sent through Sweden and Denmark.

ARTICLE 7.

Ordinary letters may be sent prepaid or unpaid, but on registered letters, and on all other correspondence mentioned in the second paragraph of the first article, prepayment shall be obligatory.

ARTICLE 8.

Registered articles shall, in addition to the postage, be subject to a register-fee of thirty öre in Sweden, of eight skilling in Norway, and of eight cents in the United States. This fee, as well as the postage, shall always be prepaid. Each office is at liberty to reduce this fee for the mails it dispatches.

ARTICLE 9.

Any correspondence may be registered, as well the international as that originating in or destined for other countries, to which the post-offices of the contracting countries may serve as intermediaries for the transmission of such registered articles.

Each office shall notify the other of the countries to which it may serve as intermediary.

ARTICLE 10.

The accounts on the international correspondence exchanged in either direction shall be adjusted and settled on the following basis, viz :

I.—*Between Sweden and the United States.*

From the total amount of international postages and register-fees for correspondence between Sweden and the United States, collected in Sweden, the Swedish postal administration shall deduct the amount which, without exceeding the highest rates agreed upon, has been paid for the conveyance of the mails to the frontier of the United States.

From the total amount of international postages and register-fees for correspondence between Sweden and the United States, collected in the United States, the postal administration of the United States shall, in like manner, deduct the amount which, without exceeding the highest rates agreed upon, has been paid for the conveyance of the mails to the frontier of Sweden, (or of Norway, in case of conveyance by direct steamship communication, or through England.)

Of the amount of the two net sums thus obtained, Sweden shall receive one moiety and the United States the other.

II.—*Between Norway and the United States.*

From the total amount of the international postages and register-fees for correspondence between Norway and the United States, collected in Norway, the Norwegian postal administration shall deduct the amount which, without exceeding the highest rates agreed upon, has been paid for the conveyance of the mails to the frontier of the United States.

From the total amount of the international postages and register-fees for correspondence between Norway and the United States, collected in the United States, the postal administration of the United States shall, in like manner, deduct the amount which, without exceeding the highest rates agreed upon, has been paid for the conveyance of the mails to the frontier of Norway, (or of Sweden, in case of conveyance by direct steamship communication, or through England.)

Of the amount of the two net sums thus obtained, Norway shall receive one moiety and the United States the other.

ARTICLE 11.

The correspondence mentioned in the second paragraph of the first article shall be dispatched under regulations to be established by the dispatching-office; but these shall embrace the following:

1. No packet shall contain anything which shall be closed against inspection, nor any written communication whatever, except to state from whom and to whom the packet is sent, and numbers and prices placed upon patterns or samples of merchandise.

2. No packet may exceed two feet in length, or one foot in any other dimension.

3. Neither office shall be bound to deliver any article, the importation of which may be prohibited by the laws or regulations of the country of destination.

4. The custom-duties that may be chargeable in each of the two countries may be levied for the use of the customs.

5. Except as above, no charge whatever shall be collected on the letters and other correspondence exchanged.

The small local carrier's fee now chargeable in Sweden may, however, be levied to the use of the Swedish office; and as long as a fee of 2 skilling for the delivery of poste restante letters, and one of 4 skilling for letters posted after the general time for collecting the post, are chargeable in Norway, these fees may be levied to the use of the Norwegian office.

ARTICLE 12.

The postal administrations of each of the United Kingdoms, and that of the United States, shall establish by agreement, and in conformity with the arrangements in force at the time, the conditions upon which the offices may exchange, in open mails, the correspondence originating in, or destined for, foreign countries to which they may serve as intermediaries.

It is, however, always understood, that such correspondence shall only be charged with the rate applicable to international correspondence augmented by the postage and other taxes due to foreign postal administrations, and any other tax for exterior service.

ARTICLE 13.

The postal accounts between the respective offices, which, according to Article 10, are to be settled separately between Sweden and the United States, and between Norway and the United States, shall be stated quarterly, and transmitted and verified as speedily as practicable, and the balance found due shall be paid to the creditor office either by exchange on London, or at the debtor office, as the creditor office may desire.

The rule for the conversion of the moneys of the respective countries shall be established by common agreement between the respective offices.

ARTICLE 14.

When in a port, whether belonging to either of the United Kingdoms or to the United States, a closed mail is transferred from one vessel to another, without any expense to the office of the country where the transfer is made, such transfer shall not be subject to any charge by one office against the other.

ARTICLE 15.

Official communications between the respective postal administrations shall not be the occasion of any accounts between them.

ARTICLE 16.

The respective post-offices shall, by mutual consent, make detailed regulations for carrying the articles of this convention into execution, and in like manner modify such regulations, from time to time, as the exigencies of the service may require.

ARTICLE 17.

Letters wrongly sent, wrongly addressed, or not deliverable for any cause, shall be returned to the dispatching-office at its expense for the return, if any expense shall be incurred. Registered articles, in the second paragraph of the first article mentioned, shall also be returned in like manner. Other articles shall be left to the disposition of the receiving-office.

Any postages not collected upon the correspondence returned, but which shall have been charged against the receiving-office, shall be deducted from the account.

ARTICLE 18.

This convention shall take effect from and on the 1st day of July, 1873. It shall be continued in force until one year from the time when any of the governments of the respective countries shall have given notice of its wish to terminate the same. It is to be ratified, and the ratifications are to be exchanged as soon as possible.

Done in duplicate original at the city of Washington this fifteenth day of March, in the year of our Lord one thousand eight hundred and seventy-three.

JNO. A. J. CRESWELL,
Postmaster-General.

[Seal of the Post-Office Department.]

OLUF STENERSEN.

[Official seal.]

I hereby approve the aforegoing convention, and in testimony thereof I have caused the seal of the United States to be affixed.

U. S. GRANT.

By the President:
HAMILTON FISH,
Secretary of State.

[Seal of the United States.]

WASHINGTON, *March* 15, 1873.

[Translation.]

We, Oscar, by the grace of God King of Sweden, Norway, the Goths and the Vandals, make known that, whereas we and the United States

of America have found it expedient and necessary to enter into negotiations having for their object the conclusion of a postal convention, and our minister, duly authorized for that purpose, having on the 15th day of March, in the present year, with the Postmaster-General of the United States, established, concluded, signed, and with his seal provided a convention, word for word, as follows:

(See convention above.)

Therefore, we have desired to ratify, approve, and accept the convention so concluded, with all its articles, paragraphs, and clauses; and we do by these presents, in the most express terms, approve, accept, and ratify the same, and we will sincerely and honestly uphold and fulfill the aforegoing convention, and all its articles, paragraphs, and clauses.

In witness whereof we have, with our own hand, signed and caused the same to be confirmed by our royal seal. Done at Stockholm Castle, on the sixteenth day of the month of May, in the year after the birth of our Lord and Saviour one thousand eight hundred and seventy-three.

OSCAR, [SEAL.]
O. M. BJORNSTJERNA.

The undersigned having met together for the purpose of exchanging the ratifications of the convention concluded at the city of Washington on the fifteenth day of March, in the year of our Lord one thousand eight hundred and seventy-three, between His Majesty the King of Sweden and Norway, and the United States of North America, concerning the exchange of correspondence between the United States of North America and the United Kingdoms of Sweden and Norway, and the respective ratifications of the said convention having been carefully compared and found to agree exactly one with the other, and both with the original of the said convention, the exchange has this day been effected in the usual form.

In witness whereof the undersigned have signed the present certificate of exchange, and have affixed thereto the seals of their arms.

Done at Stockholm the 26th day of May, 1873.

C. C. ANDREWS.
O. M. BJORNSTJERNA. [SEAL.]

DETAILED REGULATIONS AGREED UPON BETWEEN THE POST-OFFICE OF THE UNITED STATES AND THE POSTAL ADMINISTRATION OF SWEDEN FOR THE EXECUTION OF THE CONVENTION OF THE 15TH OF MARCH, 1873, BETWEEN THE UNITED STATES OF AMERICA AND THE KINGDOMS OF SWEDEN AND NORWAY.

ARTICLE 1.

The American exchange-offices of New York and Chicago shall make up mails for the Swedish exchange-offices of Goteborg, the traveling post office, No. 1, between Goteberg and Stockholm, and the traveling post-office, No. 2, between Malmo and Falköping.

The latter shall make up mails for the exchange-offices of New York and Chicago.

Table A, hereto annexed, indicates the correspondence to be distributed to each exchange-office.

ARTICLE 2.

Each mail exchanged between the respective offices shall be accompanied by a letter-bill, showing the postages and the charges of transit,

the fees, &c., accruing to each office, upon the different kinds of correspondence.

The form of this letter-bill shall follow the models B^1 and B^2, hereto annexed, and shall be consecutively numbered by the dispatching-office during each quarter of the calendar year.

The receiving-office shall acknowledge its receipt by the next dispatch.

ARTICLE 3.

The exchange-offices shall divide the correspondence which they dispatch into a suitable number of separate packages, according to the letter-bill. Each of these packages shall bear the proper etiquette and numbers corresponding to the letter-bill.

ARTICLE 4.

When more than a single rate is chargeable upon any letter or other article, the number of rates to which it is subject shall be indicated by the dispatching-office by a figure in the upper left corner of the address.

ARTICLE 5.

Registered correspondence shall be described in a register-list, following the models C^1 and C^2, hereto annexed.

All registered letters and the register-list shall be enveloped together in strong paper and securely fastened, and the packet plainly inscribed with the word "*Registered*" or "*Rekommenderas*," and placed in the mail.

The blank in the registered-letter list for expressing the number of registered articles shall be filled in letters and figures expressing the number. In case no registered articles are sent, the proper blank of the letter-bill shall be filled with the word "*Nihil*" or "*Nil.*"

ARTICLE 6.

The register-lists dispatched shall be retained by the receiving-office, which office shall acknowledge by the first mail the receipt of the registered articles, numerically, from No. — to No. —.

If the verification by the exchange-office disclose an error of any kind in the register-list, it shall be also, by the first mail, notified to the dispatching-office.

ARTICLE 7.

The two administrations mutually engage to take all needful measures for the careful transmission of registered correspondence, and for pursuing it when lost; but it is understood that neither assumes towards the other any pecuniary responsibility in case of loss.

ARTICLE 8.

All letters exchanged between the several offices shall indicate by stamp or writing thereon the office of origin; and the unpaid letters so exchanged shall also be stamped with the name of the dispatching-office of exchange.

Correspondence fully paid to destination shall be stamped in the United States "*Paid all*," and in Sweden "*Franko.*"

Registered letters shall be stamped "*Registered*" in the United States, and "*Rekommenderas*" in Sweden.

Correspondence insufficiently paid shall be stamped in the United States "*Insufficiently paid*," and in Sweden "*Offullstandigt frankerad*," and the amount of deficient postage expressed in figures (black) on the face.

Correspondence dispatched by a direct line between the respective countries shall be stamped "*Direct service*," or "*Service direct.*"

When dispatched via England or via Germany and Denmark, it shall be stamped to indicate British or German and Danish transit.

ARTICLE 9.

The respective postal administrations are mutually to furnish each other with lists stating the foreign countries to which the foreign postage, and the amount thereof, must be absolutely prepaid or can be left unpaid, and until such lists are furnished, neither country is to mail to the other any correspondence for foreign countries beyond the country to which the mail is sent.

Such lists shall also indicate the foreign countries with which registered correspondence may be exchanged in the open mails between the several offices, and the conditions thereof.

ARTICLE 10.

The respective exchange-offices shall mark, *in red ink*, in the upper corner of the address, at the right hand, of prepaid letters sent for transit in the open mail, the amount of the extra national postage due to the country through which the same are forwarded; and in the same manner and place, but in *black ink*, shall mark the amount of the extra national postage due to the forwarding country upon the unpaid letters sent in transit.

ARTICLE 11.

Articles under band, which do not conform to the condition mentioned in Article 11 of the convention, or which are in no part prepaid, shall be retained by the administration of origin, and shall remain subject to its disposal.

ARTICLE 12.

Letters originating in, or destined for, foreign countries, sent in the open mail for transit through the United States, or through Sweden, and which are insufficiently paid, shall be transmitted as wholly unpaid, and no account taken between the respective administrations of the amount prepaid.

ARTICLE 13.

Letters and all registered articles not deliverable shall be respectively returned to the dispatching adminstration at the end of every month. (See Exhibits D^1 and D^2.) But all other articles of correspondence, not registered, which from any cause cannot be delivered, shall be retained at the disposition of the receiving country.

The unpaid postages on the letters so returned shall be deducted from the account against the office originally charged therewith.

The prepaid postages on the letters so returned shall remain in the account as originally entered.

The expense of transit of unpaid correspondence which has been transported by either administration in closed mails, and shall be returned to

the dispatching-office as not deliverable, shall be deducted from the original amount charged for transit upon a declaration of the amount by the office claiming the deduction. No charge shall be made by either administration for the transit of correspondence returned as not deliverable.

ARTICLE 14.

All correspondence wrongly addressed or missent shall be returned without delay by the receiving-office to the exchange-office which dispatched it.

The receiving-office shall also correct accordingly, in the column of verification, the original entries of the letter-bill relating to such correspondence.

The articles of a like nature addressed to persons who have changed their residence shall be mutually forwarded or returned, charged with the rate that would have been paid at the first destination.

ARTICLE 15.

The dispatching exchange-office shall state on the letter-bills (for the convenience of the transit account) the exact number of single rates and weight of letters, and the total weight of the other correspondence which shall be dispatched in closed mails by the British or by the German and Danish transit.

ARTICLE 16.

It is understood that the accounts between the two offices shall be established on the respective letter-bills in the proper money of the dispatching-office, but the international postages on the unpaid letters or insufficiently-paid letters shall be computed in the money of the receiving-office.

The reduction of these moneys shall be effected in the general accounts at the rate of 4 riksdaler, or 400 öre of Sweden, for one dollar of the United States.

In entering on the letter-bills the international postage on the partly-paid letters in the money of the receiving-office, and the foreign charges in the money of the dispatching-office, the cent of the United States shall be considered as the equivalent of 4 öre of Sweden.

It is also understood that the quarterly accounts shall be paid respectively in gold, and in the denominations of the money of the creditor office.

ARTICLE 17.

The quarterly accounts mentioned in Article 13 of the convention shall be prepared by the respective postal administrations. They shall be based upon the acknowledgments of receipt, and shall respectively be prepared according to the models E^1 and E^2, hereto annexed.

A recapitulation of these accounts, showing the definitive result, alike for the debit and the credit, shall be prepared by the United States office according to the form hereto annexed and marked F; and shall then be transmitted with the quarterly accounts on which it is based, for the examination of the other office.

Done in duplicate and signed at Stockholm this 30th day of May, 1873, and at Washington this 24th day of June, 1873.

[SEAL.] WILHELM ROOS.
[SEAL OF P. O. DEPT.] JNO. A. J. CRESWELL.

TABLE A.—*Showing the directions to be given to correspondence of all kinds exchanged between the United States and Sweden.*

Mails of the Swedish office.			Mails of the United States office.		
Offices of exchange.		Destination of the correspondence to be comprised in the mails for the respective receiving offices.	Offices of exchange.		Destination of the correspondence to be comprised in the mails for the respective receiving offices.
Forwarding.	Receiving.		Forwarding.	Receiving.	
Goteborg	New York	The States of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas, Tennessee, Kentucky, Indiana, Ohio, and the District of Columbia, and the foreign countries to which the United States serve as an intermediary.	New York	Goteborg	All of Sweden.
The Travelling Post-Office No. 1, Goteborg-Stockholm, and the Travelling Post-Office No. 2, Malmö-Falköping.	Chicago	The States of Illinois, Michigan, Wisconsin, Minnesota, Missouri, Kansas, Nebraska, Nevada, California, and Oregon, and the Territories of Dakota, Colorado, New Mexico, Arizona, Utah, Wyoming, Idaho, Montana, Washington, and the Indian Territory.	Chicago	The Travelling Post-Office No. 1, Goteborg-Stockholm, and the Travelling Post-Office No. 2, Malmö-Falköping.	All of Sweden.

POST-OFFICE DEPARTMENT OF THE UNITED STATES OF AMERICA.

B[1].

CORRESPONDENCE WITH SWEDEN.

LETTER-BILL No. —.

For the mails dispatched from —— to —— via ——. Sent the ——, 187 ; arrived the ——, 187 .

No. of the items of account.	Nature of the correspondence.	Single weight.	Single rate.	Statement by the office dispatching.			Verification by the receiving office.		
				Single rates.	Amount.		Single rates.	Amounts.	
		Grams.	Cts.	Nos.	Dolls.	Cts.	No.	Dolls.	Cts.
	TABLE I.—INTERNATIONAL CORRESPONDENCE. *(Including Registered Articles—Postage only.)*								
1	Letters fully prepaid	15			—	—		—	—
2	Letters wholly unpaid	15			—	—		—	—
3	Letters insufficiently paid. No. of single rates	15			—	—		—	—
					Rks.	Ore.		Rks.	Ore.
4	Amount prepaid			—			—		
5	Amount deficient			—			—		
	Total No. of single international rates								
					Dolls.	Cts.		Dolls.	Cts.
6	Journals, Other prints, Samples. Total amount of postage-stamps affixed to the correspondence								
	TABLE II.—EXTRANATIONAL CORRESPONDENCE. *(Including Registered Articles—Postage only.)*								
7	Letters originating in the United States for foreign countries beyond Sweden. Unpaid (wholly or in part). No. of international rates				—	—		—	—
8	Fully prepaid. No. of international rates				—	—		—	—
9	Fully prepaid. Foreign postage to account for to Sweden			—			—		

10	Letters originating in foreign countries and passing in transit through the United States.	Addressed to Sweden.	Fully prepaid.	No. of international rates		—		—		—	
11			Unpaid wholly or in part.	No. of international rates		—		—		—	
12				Foreign postage to account for to the United States		—					
13		Addressed to countries beyond Sweden.	Fully prepaid.	No. of international rates				—		—	—
14				Foreign postage to account for to Sweden		—					
15			Unpaid wholly or in part.	No. of international rates				—		—	—
16				Foreign postage to account for to the United States		—					
	Total number of single rates in transit										
17	Prepaid journals, other prints, samples, etc., originating in the United States addressed to countries beyond Sweden, or originating beyond the United States and addressed to Sweden or to countries beyond Sweden.			Total amount of the international postage		—					
18				Total amount of foreign postage to account for to Sweden		—					
19	Unpaid newspapers, prints, and patterns of merchandise originating in foreign countries and passing in transit through the United States.			Total amount of the international postage		—					
20				Total amount of the foreign postage to account for to the United States		—					

TABLE III.—Of Register Fees.

21	Total number of register fees and registered articles herewith							—		—	
22	Amount of supplementary fees on same, due to countries beyond Sweden to account for to Sweden					—					

TABLE IV.—Letters Forwarded for Change of Residence.

23	Letters, prepaid and unpaid, of whatever origin, forwarded to persons who have changed their national address.			Prior postage unpaid, amount to account for to exclusive credit of United States		—					
				Expense of returning the correspondence							
24				No. of rates at —— cents per single rate							

[*Memo.*—Articles missent or wrongly addressed. Note the number of articles ——.]

No. of registered articles by this mail.

TABLE V.—For Accounting for Intermediate Transit.

25	Total number of single rates of letters sent by this mail. (See items 1, 2, 3, 7, 8, 10, 11, 13, 15, and 24 of this letter-bill.)							—		—	
								Grams.		Grams.	
26	Total weight (net) of articles in this mail,			Letters							
27				Journals, etc., etc							

GENERAL POST-OFFICE OF SWEDEN. } B³. { CORRESPONDENCE WITH THE UNITED STATES OF AMERICA.

LETTER-BILL No. —.

For the Mails dispatched from ——— to ——— via ———. Sent the ———, 187–; arrived the ———, 187–.

Nos. of the Items of account.	Nature of the correspondence.	Single weight.	Single rate.	Statement by the Dispatching Office.			Verification by the Receiving Office.		
				Single rates.	Amounts.		Single rates.	Amounts.	
		Grams.	Ore.	Nos.	Rks	Ore.	Nos.	Rks.	Ore.
	TABLE I.—INTERNATIONAL CORRESPONDENCE. *(Including Registered Articles—Postage only.)*								
1	Letters fully prepaid	15			—	—		—	—
2	Letters wholly unpaid	"			—	—		—	—
3	Letters insufficiently prepaid . Number of single rates	"			—	—		—	—
4	Letters insufficiently prepaid . Amount prepaid			—	Dolls.	Cts.	—	Dolls.	Cts.
5	Letters insufficiently prepaid . Amount deficient			—			—		
	Total number of single international rates								
6	Journals, Other prints, Samples. Total amount of postage-stamps affixed to the correspondence				Rks.	Ore.		Rks.	Ore.
	TABLE II.—EXTRANATIONAL CORRESPONDENCE. *(Including Registered Articles—Postage only.)*								
7	Letters originating in Sweden for countries beyond the United States. Unpaid (wholly or in part.) Number of international rates				—	—		—	—
8	Letters originating in Sweden for countries beyond the United States. Fully prepaid.. Number of international rates				—	—		—	—
9	Letters originating in Sweden for countries beyond the United States. Fully prepaid.. Foreign postage to account for to the United States			—			—		—
10	Letters originating in foreign countries in transit through Sweden. Addressed to the United States. Fully prepaid. No. of international rates				—	—		—	—
11	Letters originating in foreign countries in transit through Sweden. Addressed to the United States. Unpaid (wholly or in part.) Number of international rates				—	—		—	—
12	Letters originating in foreign countries in transit through Sweden. Addressed to the United States. Unpaid (wholly or in part.) Foreign postage to account for to Sweden			—			—		
13	Letters originating in foreign countries in transit through Sweden. Addressed to countries beyond the Fully prepaid.. Number of international rates				—	—		—	
14	Letters originating in foreign countries in transit through Sweden. Addressed to countries beyond the Fully prepaid.. Foreign postage to account for to United States			—			—		

					Statement by the Dispatching Office.			Verification by the Receiving Office.		
					Total No. of rates by this mail.	Amounts.		Total No. of rates by this mail.	Amounts.	
						Rdr.	Ore.		Rdr.	Ore.
15	United States.	Unpaid (wholly or in part.)	Number of international rates		—	—	—	—	—	—
16			Foreign postage to account for to Sweden		—	—	—	—	—	—
	Total number of single rates in transit				—	—	—	—	—	—
17	Prepaid journals, other prints, samples, &c., originating in Sweden for countries beyond the United States, or originating in countries beyond Sweden for the United States or countries beyond the United States.		Total amount of international postage		—			—		
18			Foreign postage to account for to United States		—			—		
19	Unpaid journals, other prints, and samples originating in foreign countries and in transit through Sweden.		Total amount of international postage		—			—		
20			Total amount of the foreign postage to account for to Sweden		—			—		
	TABLE III.—Of Register Fees.									
21	Total number of register fees and registered articles herewith				—	—	—	—	—	—
22	Amount of supplementary fees on same, due to countries beyond the United States, to account for to the United States				—			—		
	TABLE IV.—Letters Forwarded for Change of Residence.									
23	Letters prepaid and unpaid, of whatever origin, forwarded to persons who have changed their residence.		Prior postage unpaid, amount to account for to exclusive credit of Sweden		—			—		
			Expense of returning the correspondence							
24			No. of rates at — ore per single rate							
	[*Memo.*—No. of articles missent or wrongly addressed]									
	No. of registered articles by this mail:									
	TABLE V.—For Accounting for Intermediate Transit.									
25	Total number of single rates of letters sent by this mail, (see items 1, 2, 3, 7, 8, 10, 11, 13, 15, and 24 of this letter-bill)				—	—		—	—	
					Grams.			Grams.		
26	Total weight (net) of articles in this mail		Letters							
27			Journals, &c., &c.							

POST-OFFICE DEPARTMENT OF THE UNITED STATES. } C[1]. { CORRESPONDENCE WITH SWEDEN.

Descriptive list of the letters and other registered articles contained in the mail sent by the United States office of exchange of ——— to the Swedish office of exchange of ———, the ———, 187–.

Number.	Nature of the registered articles. (Whether letters, newspapers, &c.)	Origin.	To whom addressed.	Destination.	Amount of supplementary register fees to pay to Sweden, on registered articles destined for foreign countries.	
					Dollars.	Cents.
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
Total number of the registered articles to be carried to Article 21 of the letter-bill.						
Total amount to be carried to Article 22 of the letter-bill					$	

Verified by ——— ———.

Certified by ——— ———.

GENERAL POST-OFFICE OF SWEDEN. } C². { CORRESPONDENCE WITH THE UNITED STATES.

Descriptive list of the letters and other registered articles contained in the mail sent by the Swedish office of exchange of ———, to the United States office of exchange of ———, the ——— 187–.

Number.	Nature of the registered articles. (Whether letters, newspapers, &c.)	Origin.	To whom addressed.	Destination.	Amount of supplementary register fees to pay to the United States on registered articles destined for foreign countries.	
					Rdr.	Ore.
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
Total number of the registered articles to be carried to Article 21 of the letter-bill.					———	———
Total amount to be carried to Article 22 of the letter-bill .....Am't..						

Certified by ——— ———.

Verified by ——— ———.

10 P M

POST-OFFICE DEPARTMENT OF THE UNITED STATES OF AMERICA.

D[1].

CORRESPONDENCE WITH SWEDEN.

DEAD-LETTER BILL

Of the correspondence returned from the United States to Sweden as not deliverable, for the month of ——, 187–.

Number of the items of account.	Nature of the correspondence.	By what route received.	Statement by the United States office. Number of rates.	Amount. Dollars.	Cents.	Verification by the Swedish office. Number of rates.	Amount. Dollars.	Cents
	TABLE I.—INTERNATIONAL CORRESPONDENCE.							
1	Prepaid letters No.		——	——	——	——	——	——
2	Unpaid letters	Via England						
		Via direct						
		Via Denmark and Germany						
3	Insufficiently paid letters	Via England						
4		Via direct						
		Via Denmark and Germany						
5		Amount of deficient postage	——	——		——		
	TABLE II.—EXTRANATIONAL CORRESPONDENCE.							
7	Letters from Sweden for countries beyond United States — Unpaid	Via England						
		Via direct						
		Via Denmark and Germany						
9	Prepaid No.		——	——	——	——	——	——
10	Letters from foreign countries for the United States — Prepaid No.		——	——	——	——	——	——
11	Unpaid	Via England						
		Via direct						
		Via Denmark and Germany						
				Rdr.	Öre.		Rdr.	Öre.
12	Foreign rates reclaimed by United States		——	——		——		
13	Letters from foreign countries for countries beyond the United States — Prepaid No.		——	——	——	——	——	——
15	Unpaid	Via England						
		Via direct						
		Via Denmark and Germany						
				Rdr.	Öre.		Rdr.	Öre.
16	Foreign rates reclaimed by United States		——	——		——		

TABLE III.—REGISTERED CORRESPONDENCE. (*See list on back hereof.*)

19	Registered articles returned	Letters No	———	———	———	———	———	———	———	———
		Prints No	———	———	———	———	———	———	———	———

TABLE V.—TRANSIT ACCOUNT.

				Grammes.		Grammes.	
25	Total rates and net weight of letters returned to be deducted from transit account.	Via England					
26	See items 2, 3, 7, 11, 12, 15, and 16	Via direct					
		Via Denmark and Germany					

WASHINGTON, D. C., ———, 187–.

SIR: I have the honor, by direction of the Postmaster-General, herewith to send to your address a bag containing the letters designated by the foregoing account, and to request the verification of the same, and early return of the accompanying duplicate.

I am, very respectfully, your obedient servant,

The DIRECTOR-GENERAL OF POSTS, &c., *Stockholm, Sweden.*

——— ———, *Third Assistant Postmaster-General.*

List of registered articles returned, (*see item* 19.)

No.	Index number.	Addresses.	No.	Index number.	Addresses.
1			14		
2			15		
3			16		
4			17		
5			18		
6			19		
7			20		
8			21		
9			22		
10			23		
11			24		
12			25		
13					

GENERAL POST-OFFICE OF SWEDEN. } D². { CORRESPONDENCE WITH THE UNITED STATES.

DEAD-LETTER BILL

Of the correspondence returned from Sweden to the United States as not deliverable, for the month of ——, 187–.

Number of the items of account.	Nature of the correspondence.	By what route received.	Statement by the Swedish office. Number of rates.	Statement by the Swedish office. Amount. Rdr.	Statement by the Swedish office. Amount. Öre.	Verification by the United States office. Number of rates.	Verification by the United States office. Amount. Rdr.	Verification by the United States office. Amount. Öre.
	TABLE I—INTERNATIONAL CORRESPONDENCE.							
1	Prepaid letters No.	——	——	——	——	——	——	——
2	Unpaid lettters	Via England						
		Via direct						
		Via Germany and Denmark						
3	Insufficiently-paid letters	Via England						
4		Via direct						
		Via Germany and Denmark						
5		Amount of deficient postage	——	——		——		
	TABLE II.—EXTRANATIONAL CORRESPONDENCE.							
7	Letters from the United States for countries beyond Sweden — Unpaid	Via England						
		Via direct						
		Via Germany and Denmark						
9	Prepaid No.	——	——	——	——	——	——	——
10	Letters from foreign countries for Sweden — Prepaid No.	——	——	——	——	——	——	——
11	Unpaid	Via England						
		Via direct						
		Via Germany and Denmark						
				Dlls.	Cts.		Dlls.	Cts.
12	Foreign rates reclaimed by Sweden	——	——	——	——	——	——	——
13	Letters from foreign countries for countries beyond Sweden — Prepaid No.	——	——	——	——	——	——	——
15	Unpaid	Via England						
		Via direct						
		Via Germany and Denmark						
				Dlls.	Cts.		Dlls.	Cts.
16	Foreign rates reclaimed by Sweden	——	——	——	——	——	——	——

	TABLE III.—REGISTERED CORRESPONDENCE. *(See list on back hereof.)*									
19	Registered articles returned.....	Letters No.....	———	——	—	—	—	—	—	
		Prints No.....	———	——	—	—	—	—	—	
	TABLE V.—*Transit account.*						Grammes.		Grammes.	
25	Total rates and net weight of letters returned, to be deducted from transit account. (See items 2, 3, 7, 11, 12, 15, and 16.)	Via England.....								
26		Via direct.....								
		Via Germany and Denmark.								

STOCKHOLM, ——, 187–.

SIR: I have the honor, by direction of the Postmaster-General, herewith to send to your address a bag containing the letters designated by the foregoing account, and to request the verification of the same, and early return of the accompanying duplicate.

I am, very respectfully, your obedient servant,

——— ———,
Assistant Postmaster-General.

The POSTMASTER-GENERAL, *&c., &c., &c., Washington.*

List of registered articles returned, (see item 19.*)*

No.	Index number.	Addresses.	No.	Index number.	Addresses.
1			14		
2			15		
3			16		
4			17		
5			18		
6			19		
7			20		
8			21		
9			22		
10			23		
11			24		
12			25		
13					

E[1].

QUARTERLY

Of the Mails sent by the United States Exchange Office of ——— ———
18—,

	1	2	4	5	6	7	8	9	10	11	12	13	14	15	16
	I.—International Correspondence.					II.—Extranational									
	Prepaid letters.	Unpaid letters.	Letters insufficiently paid.		Journals, &c.	Letters originating in the United States for transit to countries beyond Sweden.			Letters originating outside of the U. S. and forwarded in the U. S. mails—						
									Addressed to Sweden.			Addressed to countries beyond Sweden.			
			Total amount prepaid.	Total amount deficient.	Total amount prepaid.	Unpaid.		Prepaid.	Prepaid.	Unpaid.		Prepaid.		Unpaid.	
	Number of rates.	Number of rates.	Rdr Öre	Rdr Öre	$ ct	Number of rates.	Number of rates.	Amount of foreign postage to account for to Sweden. $ ct	Number of rates.	Number of rates.	Amount of foreign postage to account for to U. S. $ ct	Number of rates.	Amount of foreign postage to account for to Sweden. $ ct	Number of rates.	Amount of foreign postage to account for to U. S. $ ct
Totals															
Aggreg'te of dead matter returned	—		—	—			—	-		—	—	-	—	—	-
Net totals															
At rate of	10–6		—	—	—	—	—	-	10–6	—	-	10–6	—	-	10–6	—	-
Sums															

ACCOUNT

to the Swedish Exchange Office of ———, *during the quarter ending* ——— *via* ———.

17		18		19		20		21	22	23		24		25-26	27
CORRESPONDENCE.								III.—REGISTER FEES.		IV.—LETTERS RESENT.				V.—INTERMEDIATE TRANSIT.	
Prepaid journals, prints, samples, &c., originating in the U. S. and addressed to countries beyond Sweden, or coming from countries outside of the U. S. and addressed to Sweden or to countries beyond.				Unpaid journals, prints, and patterns of merchandise originating in foreign countries and passing in transit through the U. S.				Number of the registered articles sent.	Number of the supplementary register fees to account for to Sweden for the countries beyond.	Letters unpaid and prepaid, wherever originating, forwarded to persons who have changed their national residence.				Via ———.	
Amount of the international postage.		Amount of the foreign postage to account for to Sweden for countries beyond.		Amount of the international postage.		Amount of the foreign postage to be accounted for to U. S.				Amount of the supplement to account for to Sweden for countries beyond.		Prior postage unpaid. Amount to account for to credit of U. S.		Expense of return.		Letters.	Journals, &c.
$	cts.	$	cts.	$	cts.	$	cts.			$	cts.	$	cts.	Number of rates.	Amounts.		
															$	cts.	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Summary of the within account.

Sums for which the United States must account to Sweden.					Sums for which Sweden must account to the United States.				
For items of the account.	Nos.	Sums to be divided.		Sums wholly due to Sweden.	For items of the account.	Nos.	Sums to be divided.		Sums wholly due to U. S.
	1			— –		2			— –
	4			— –		5			— –
	6			— –		7			— –
	8			— –		11			— –
	9	—	–			12	—	–	
	10			— –		15			— –
	13			— –		16	—	–	
	14	—	–			19			
	17			— –		20	—	–	
	18	—	–			23	—	–	
	21			— –		24			— –
	22	—	–				—	–	— –
		—	–	— –	Totals				
Totals									
					One-half (½) to United States is				— –
Deduct intermediate transit charges. Letters.	25, 26	Dolls.	cts.		Total amount due United States				
Journals, &c.	27								
Balance to be divided is		—	–						
One-half (½) to Sweden is									
Total amount due Sweden									
				— –					
Total amount due to United States.									
Balance due to Sweden									

Dated at —— this —— day of ——, 187–

E².

QUARTERLY

Of the mails sent by the Swedish Exchange Office of —— to the United States

	1	2	4	5	6	7	8	9	10	11	12	13	14	15	16
	I.—International Correspondence.					II.—Extranational									
	Prepaid letters.	Unpaid letters.	Letters insufficiently paid.		Journals, &c,	Letters originating in Sweden for transit to countries beyond the United States.		Letters originating outside of Sweden and forwarded in the Swedish mails.							
								Addressed to the United States.			Addressed to countries beyond the United States.				
						Unpaid.	Prepaid.	Prepaid.	Unpaid.		Prepaid.	Unpaid.			
	Number of rates.	Number of rates.	Number of rates.	Total amount prepaid.	Number of rates.	Number of rates.	Total amount prepaid.	Number of rates.	Number of rates.	Amount of foreign postage to account for to the United States.	Number of rates.	Number of rates.	Amount of foreign postage to account for to Sweden.	Number of rates.	Amount of foreign postage to account for to the United States.
				Dolls. Cts.			Rdr. Öre.			Rdr. Öre.			Rdr. Öre.		Rdr. Öre.
Totals															
Aggregate of dead-matter returned	—		—	—		—	—		—	—	—	—		—	—
Net totals															
At rate of	10–6		—	—	—	—	—		10–6	—	—	10–6		—	—
Sums															

ACCOUNT.

Exchange Office of —— *during the quarter ending* ——, 187–, *via* ——.

17	18	19	20	21	22	23	24	25—26	27
CORRESPONDENCE.				III.—REGISTER FEES.		IV.—LETTERS RESENT.		V.—INTERMEDIATE TRANSIT.	
Prepaid journals, prints, samples, &c., originating in Sweden and addressed to countries beyond the United States, or coming from countries outside of Sweden and addressed to the United States or countries beyond.		Unpaid journals, prints, and patterns of merchandise originating in foreign countries and passing in transit through Sweden.		Number of the register fees received on the registered articles sent.*	Supplementary register fees to account for the countries beyond.	Letters unpaid and prepaid, wherever originating, forwarded to persons who have changed their national residence.		Via ——.	
Rdr. Öre. Amount of the international postage.	Rdr. Öre. Amount of the foreign postage to account for to the United States for countries beyond.	Rdr. Öre. Amount of the international postage.	Rdr. Öre. Amount of the foreign postage to be accounted for to Sweden.	Number of rates.	Rdr. Öre. Amount.	Prior postage unpaid—amount to account for to exclusive credit of Sweden.	Expense of return.	Letters.	Journals.

Summary of the within account.

Sums for which Sweden must account to the United States.					Sums for which the United States must account to Sweden.				
For items of the account.	Nos.	Sums to be divided.		Sums wholly due to U. S.	For items of the account.	Nos.	Sums to be divided.		Sums wholly due to Sweden.
		$	c.	$ c.			$	c.	$ c.
	1			— —		2			— —
	4			— —		5			— —
	6			— —		7			— —
	8			— —		11			— —
	9	—	—			12	—	—	
	10			— —		15			— —
	13			— —		16	—	—	
	14	—	—			19			
	17			— —		20	—	—	
	18	—	—			23	—	—	
	21			— —		24			— —
	22								
Totals					Totals				
Deduct intermediate transit charges. Letters, 25, 26...		Dolls	Cts						
Deduct intermediate transit charges. Journals, &c., 27..					One-half (½) to Sweden is ...				
Balance to be divided is.....					Total amount due to Sweden				
One-half (½) to United States is.....									
Total amount due to United States									
Total amount due to Sweden.									
Balance due to the United States									

Dated at —— this —— day of ——, 187-.

POST-OFFICE DEPARTMENT OF THE UNITED STATES OF AMERICA. } F. { CORRESPONDENCE WITH SWEDEN.

RECAPITULATION.

For the quarter ending ——, 187–.

Quarterly account.	Mails sent by the way of—	Net balance in favor of the United States office.		Net balance in favor of the Swedish office.	
EAST.					
New York to Goteborg	England				
Chicago to Goteborg	do				
New York to Goteborg	Direct				
Chicago to Goteborg	do				
New York to ——	Germany and Denmark				
Chicago to ——	do				
WEST.					
Goteborg to New York	England				
Goteborg to Chicago	do				
Goteborg to New York	Direct				
Goteborg to Chicago	do				
—— to New York	Denmark and Germany				
—— to Chicago	do				
Totals					
Balance in favor of —— is					
Final balance in favor of —— is					

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, ——, 187–.

DETAILED REGULATIONS AGREED UPON BETWEEN THE POST-OFFICE OF THE UNITED STATES AND THE POSTAL ADMINISTRATION OF NORWAY FOR THE EXECUTION OF THE POSTAL CONVENTION OF THE 15TH OF MARCH, 1873, BETWEEN THE UNITED STATES OF AMERICA AND THE KINGDOMS OF SWEDEN AND NORWAY.

ARTICLE I.

The American exchange offices of New York and Chicago shall make up mails for the Norwegian exchange offices of Christianssand, Christiania, Bergen, and the sea post-office on the steamboat line between Hammerfest and Hamburg.

The latter shall make up mails for the exchange offices of New York and Chicago.

ARTICLE II.

Each mail exchanged between the two countries shall be accompanied by a letter-bill, showing the postages on each class of correspondence, the number of register fees, total weight of correspondence, &c.

The form of this letter-bill shall follow the models A^1 and A^2, hereto annexed, and shall be consecutively numbered by the dispatching office during each quarter of the calendar year.

The receiving office shall acknowledge its receipt by the next dispatch.

ARTICLE III.

The exchange offices shall divide the correspondence which they dispatch into a suitable number of separate packages, according to the letter-bill.

Each of these packages shall bear the proper etiquette and numbers corresponding to the letter-bill.

ARTICLE IV.

When more than a single rate is chargeable upon any letter or other article, the number of rates to which it is subject shall be indicated by the dispatching office by a figure in the upper left corner of the address.

ARTICLE V.

Registered correspondence shall be described in a register-list, following the models B^1 and B^2 hereto annexed.

All registered letters and the register-list shall be enveloped together in strong paper and securely fastened, and the packet plainly inscribed with the word "Registered" or "Registreret," and placed in the mail.

The blank in the registered letter-list for expressing the number of registered articles shall be filled in letters and figures expressing the number. In case no registered articles are sent, the proper blank of the letter-bill shall be filled with the word "Nihil" or "Nil."

ARTICLE VI.

The register-lists dispatched shall be retained by the receiving office, which office shall acknowledge by the first mail the receipt of the registered articles numerically from No. — to No. —.

If the verification by the exchange office disclose an error of any kind in the register-list, it shall be also, by the first mail, notified to the dispatching office.

ARTICLE VII.

The two administrations mutually engage to take all needful measures for the careful transmission of registered correspondence and for pursuing it when lost, but it is understood that neither assumes toward the other any pecuniary responsibility in case of loss.

ARTICLE VIII.

All letters exchanged between the two countries shall indicate by stamp or writing thereon the office of origin; and the unpaid letters so exchanged shall also be stamped with the name of the dispatching office of exchange.

Correspondence fully paid to destination shall be stamped in the United States "Paid all," and in Norway "Franco."

Registered articles shall be stamped "Registered" in the United States, and "Anbefalet" in Norway.

Correspondence insufficiently paid shall be stamped in the United States, "Insufficiently paid," and in Norway, "Utilstrækkeligt frankeret," and the amount of deficient postage expressed in figures (black) on the face.

Correspondence dispatched by a direct line between the respective countries shall be stamped "Direct service" or "Service direct."

When dispatched via England or via Germany, it shall be stamped to indicate British or German transit.

ARTICLE IX.

The respective postal administrations are mutually to furnish each other with lists stating the foreign countries to which the foreign postage, and the amount thereof, must be absolutely prepaid or can be left unpaid; and until such lists are furnished neither country is to mail to the other any correspondence for foreign countries beyond the country to which the mail is sent.

Such lists shall also indicate the foreign countries with which registered correspondence may be exchanged in the open mails between the several offices and the conditions thereof.

ARTICLE X.

The respective exchange offices shall mark in red ink in the upper corner of the address at the right hand of prepaid letters sent for transit in the open mail the amount of the extranational postage due to the country through which the same are forwarded; and in the same manner and place, but in black ink, shall mark the amount of the extranational postage due to the forwarding country upon the unpaid letters sent in transit.

ARTICLE XI.

Articles under band, which do not conform to the conditions mentioned in Article XI of the convention, or which are in no part prepaid, shall be retained by the administration of origin, and shall remain subject to its disposal.

ARTICLE XII.

Letters originating in or destined for foreign countries, sent in the open mail for transit through the United States or through Norway, and

which are insufficiently paid shall be transmitted as wholly unpaid and no account taken between the respective administrations of the amount prepaid.

ARTICLE XIII.

Letters and all registered articles not deliverable shall be respectively returned to the dispatching administration at the end of every month. (See Exhibits C[1] and C[2].) But all other articles of correspondence not registered which, from any cause cannot be delivered, shall be retained at the disposition of the receiving country.

The unpaid postages on the letters so returned shall be deducted from the account against the office originally charged therewith.

The prepaid postages on the letters so returned shall remain in the account as originally entered.

The expense of transit of unpaid correspondence which has been transported by either administration in closed mails and shall be returned to the dispatching office as not deliverable, shall be deducted from the original amount charged for transit upon a declaration of the amount by the office claiming the deduction. No charge shall be made by either administration for the transit of correspondence returned as not deliverable.

ARTICLE XIV.

All correspondence wrongly addressed or missent shall be returned without delay by the receiving office to the exchange office which dispatched it.

The receiving office shall also correct accordingly in the column of verification the original entries of the letter-bill relating to such correspondence. The articles of a like nature addressed to persons who have changed their residence shall be mutually forwarded or returned, charged with the rate that would have been paid at the first destination.

ARTICLE XV.

The dispatching exchange office shall state on the letter-bills (for the convenience of the transit account) the exact number of single rates and weight of letters and the total weight of the other correspondence which shall be dispatched in closed mails by the British or by the German transit.

ARTICLE XVI.

It is understood that the accounts between the two offices shall be established on the respective letter-bills, in the proper money of the dispatching office, but the international postages on the unpaid letters or insufficiently paid letters shall be computed in the money of the receiving office.

The reduction of these moneys shall be effected in the general accounts at the rate of 112 skillings of Norway for one dollar of the United States.

In entering on the letter-bills the international postages on the partly paid letters in the money of the receiving office and the foreign charges in the money of the dispatching office, the cent of the United States shall be considered as the equivalent of $1\frac{1}{8}$ skilling of Norway.

It is also understood that the quarterly accounts shall be paid respectively in coin, and in the denominations of the money of the creditor office.

ARTICLE XVII.

The quarterly accounts mentioned in Article XIII of the convention shall be prepared by the respective postal administrations. They shall be based upon the acknowledgments of receipts, and shall respectively be prepared according to the models D^1 and D^2 hereto annexed.

A recapitulation of these accounts, showing the definitive results, alike for the debit and the credit, shall be prepared by the United States office according to the form hereto annexed and marked E; and shall then be transmitted with the quarterly accounts on which it is based, for the examination of the other office.

Done in duplicate and signed at Washington the 26th of June, 1873, and at Christiania the 31st May, 1873.

JNO. A. J. CRESWELL,
Postmaster-General.
W. JOHANSEN,
Oppen.

11 P M

POST-OFFICE DEPARTMENT OF THE UNITED STATES OF AMERICA.

A[1].

CORRESPONDENCE WITH NORWAY.

LETTER-BILL NO. ——

For the Mails dispatched from —— to —— via ——. Sent the——, 187–; arrived the ——, 187–.

No. of the items of account.	Nature of the correspondence.	Single weight.	Single rate.	Statement by the Despatching Office.			Verification by the Receiving Office.		
				Single rates.	Amounts.		Single rates.	Amounts.	
		Grams.	Cts.	Number.	Dolls.	Cts.	Number.	Dolls.	Cts.
	TABLE I.—INTERNATIONAL CORRESPONDENCE. *(Including Registered Articles—Postage only.)*								
1	Letters fully prepaid	15			—	—		—	—
2	Letters wholly unpaid	15			—	—		—	—
3	Letters insufficiently paid. No. of single rates	15			—	—		—	—
					Spd.	Sk.		Spd.	Sk.
4	Letters insufficiently paid. Amount prepaid			— —			— —		
5	Letters insufficiently paid. Amount deficient			— —			— —		
	Total No. of single international rates			—			—		
					Dolls.	Cts.		Dolls.	Cts.
6	Journals, Other prints, Samples, Total amount of postage-stamps affixed to the correspondence								
	TABLE II.—EXTRANATIONAL CORRESPONDENCE. *(Including Registered Articles—Postage only.)*								
7	Letters originating in the United States for foreign countries beyond Norway. Unpaid (wholly or in part.) No. of international rates				—	—		—	—
8	Letters originating in the United States for foreign countries beyond Norway. Fully prepaid. No. of international rates				—	—		—	—
9	Letters originating in the United States for foreign countries beyond Norway. Fully prepaid. Foreign postage to account for to Norway			— —			— —		
10	Letters originating in foreign countries and passing in transit through the United States. Addressed to Norway. Fully prepaid. No. of international rates				—	—		—	—
11	Letters originating in foreign countries and passing in transit through the United States. Addressed to Norway. Unpaid wholly or in part. No. of international rates				—	—		—	—
12	Letters originating in foreign countries and passing in transit through the United States. Addressed to Norway. Unpaid wholly or in part. Foreign postage to account for to United States			— —			— —		
13	Letters originating in foreign countries and passing in transit through the United States. Addressed to countries beyond Norway. Fully prepaid. No. of international rates				—	—		—	—
14	Letters originating in foreign countries and passing in transit through the United States. Addressed to countries beyond Norway. Fully prepaid. Foreign postage to account for to Norway			— —			— —		
15	Letters originating in foreign countries and passing in transit through the United States. Addressed to countries beyond Norway. Unpaid wholly or in part. No. of international rates				—	—		—	
16	Letters originating in foreign countries and passing in transit through the United States. Addressed to countries beyond Norway. Unpaid wholly or in part. Foreign postage to account for to United States			— —			— —		

	Total number of single rates in transit									
17	Prepaid journals, other prints, samples, etc., originating in the United States addressed to countries beyond Norway or originating beyond the United States and addressed	Total amount of the international postage								
18	to Norway, and to countries beyond Norway.	Total amount of foreign postage to account for to Norway								
19	Unpaid newspapers, prints, and patterns of merchandise originating in foreign countries and passing in transit through the United States.	Total amount of the international postage								
20		Total amount of the foreign postage to account for to the United States.								

TABLE III.—Of Register Fees.

21	Total number of register fees and registered articles herewith									
22	Amount of supplementary fees on same, due to countries beyond Norway to account for to Norway									

TABLE IV.—Letters Forwarded for Change of Residence.

23	Letters, prepaid and unpaid, of whatever origin, forwarded to persons who have changed their national address.	Prior postage unpaid, amount to account for to exclusive credit of United States								
24		Expense of returning the correspondence. No. of rates at — cents per single rate [*Memo.*—Articles missent or wrongly addressed. Note the number of articles]								

No. of registered articles by this mail:

TABLE V.—For Accounting for Intermediate Transit.

		Total No. of rates by this mail.	Amounts.		Total No. of rates by this mail.	Amounts.	
			Dolls.	Cts.		Dolls.	Cts.
25	Total number of single rates of letters sent by this mail. (See items 1, 2, 3, 7, 8, 10, 11, 13, 15, and 24 of this Letter-Bill.)		—	—		—	—
		Grams.			Grams.		
26	Total weight (net) of articles in this mail, Letters						
27	Journals, etc., etc						

LETTER-BILL NO. ——.

For the mails dispatched from —— to ——, via ——. Sent the ——, 187–; arrived the ——, 187–.

Nos. of the items of account.	Nature of the correspondence.	Single weight.	Single rate.	Statement by the Norwegian Office.			Verification by the United States Office.		
				Single rates.	Amounts.		Single rates.	Amounts.	
		Grams.	Sk.	No.	Spd.	Sk.	No.	Spd.	Sk.
	TABLE I.—INTERNATIONAL CORRESPONDENCE. *(Including Registered Articles—Postage only.)*								
1	Letters fully prepaid	15			—	—		—	—
2	Letters wholly unpaid	15			—	—		—	—
3	Letters insufficiently prepaid.. Number of single rates	15			—	—		—	—
					Dolls.	Cts.		Dolls.	Cts.
4	Amount prepaid			—			—		
5	Amount deficient			—			—		
	Total number of single international rates								
					Spd.	Sk.		Spd.	Sk.
6	Journals, Other prints, Samples. Total amount of postage-stamps affixed to the correspondence	50							
	TABLE II.—EXTRANATIONAL CORRESPONDENCE. *(Including Registered Articles—Postage only.)*								
7	Letters originating in Norway for countries beyond the United States. Unpaid (wholly or in part.) Number of international rates				—	—		—	—
8	Fully prepaid.. Number of international rates				—	—		—	—
9	Foreign postage to account for to the United States			—			—		

10	Letters originating in foreign countries in transit through Norway.	Addressed to the United States.	Fully prepaid.	Number of international rates			—		—		—
11			Unpaid, wholly or in part.	Number of international rates			—		—		—
12				Foreign postage to account for to Norway	—			—		—	
13		Addressed to countries beyond the United States.	Fully prepaid	Number of international rates			—		—		—
14				Foreign postage to account for to United States	—			—		—	
15			Unpaid, wholly or in part.	Number of international rates			—		—		—
16				Foreign postage to account for to Norway	—			—		—	
	Total number of single rates in transit										
17	Prepaid journals, other prints, samples, &c., originating in Norway for countries beyond the United States, or originating in countries beyond Norway for the United States and countries beyond the United States.			Total amount of international postage							
18				Foreign postage to account for to United States	—			—			
19	Unpaid journals, other prints, and samples originating in foreign countries and in transit through Norway.			Total amount of international postage							
20				Foreign postage to account for to Norway	—			—			
	TABLE III.—Of Register Fees.										
21	Total number of the register fees and registered articles herewith						—		—		—
22	Amount of supplementary fees on same, due to countries beyond the United States, to account for to the United States				—			—			
	TABLE IV.—Letters Forwarded for Change of Residence.										
23	Letters, prepaid and unpaid, of whatever origin, forwarded to persons who have changed their residence.			Prior postage unpaid to account for to Norway	—			—			
24				Expense of returning the correspondence. No. of rates at —— skill. per single rate.							
	[*Memo.*—No. of articles missent or wrongly addressed]										
	Number of registered articles by this mail:										
	TABLE V.—For Accounting for Intermediate Transit.										
25	Total number of single rates of letters sent by this mail (See items 1, 2, 3, 7, 8, 10, 11, 13, 15, and 24 of Letter-Bill.)						—	—		—	—
					Grams.				Grams.		
26	Net weight of articles in this mail.			Letters							
27				Journals, &c							

POST-OFFICE DEPARTMENT OF THE UNITED STATES. B[1]. CORRESPONDENCE WITH NORWAY.

DESCRIPTIVE LIST

Of the Letters and other Registered Articles contained in the mail sent by the United States Office of Exchange of ——— to the Norwegian Office of Exchange of ———, the ———, 187–.

Numbers.	Nature of the Registered Articles, (whether letters, newspapers, &c.)	Origin.	To whom addressed.	Destination.	Amount of Supplementary Register Fees to pay to Norway on Registered Articles destined for Foreign Countries.	
					Dollars.	Cents.
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
Total number of the Registered Articles to be carried to Article 21 of the Letter-Bill is.....						
Total amount to be carried to Article 22 of the Letter-Bill					$	

Certified by ——— ———.

Verified by ——— ———.

THE NORWEGIAN MARINE AND POST DEPARTMENT. } B². { CORRESPONDENCE WITH THE UNITED STATES.

DESCRIPTIVE LIST

Of the Letters and other Registered Articles contained in the mail sent by the Norwegian Office of Exchange of ———, to the United States Office of Exchange of ———, the ———, 187–.

Numbers.	Nature of the Registered Articles.	Origin.	To whom addressed.	Destination.	Amount of Supplementary Register Fees to pay to the United States Office on Registered Articles destined for Foreign Countries.	
					Spd.	Skill.
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
Total number of the Registered Articles to be carried to Article 21 of the Letter-Bill						
Total amount to be carried to Article 22 of the Letter-Bill						

Certified by ——— ———.

Verified by ——— ———.

POST-OFFICE DEPARTMENT OF THE UNITED STATES OF AMERICA. } C[1]. { CORRESPONDENCE WITH NORWAY.

DEAD-LETTER BILL

Of the correspondence returned from the United States to Norway as not deliverable, for the month ——, 187–.

List of the items of account.	Nature of the correspondence.	By what route received.	Statement by the United States Office.			Verification by the Norwegian Office.		
			No. of rates.	Amount.		No. of rates.	Amount.	
				Dolls.	Cts.		Dolls.	Cts.
	TABLE I. *International correspondence.*							
1	Prepaid letters, No.....	———	—	—	—	—	—	—
2	Unpaid letters	via England.		—	—		—	—
		Direct.....		—	—		—	—
		via Germany.		—	—		—	—
3	Insufficiently-paid letters.	via England		—	—		—	—
4		Direct.....		—	—		—	—
5		via Germany.		—	—		—	—
	Amount of deficient postage.	———	—			—		
	TABLE II. *Extranational correspondence.*							
7	Letters from Norway for countries beyond the United States. Unpaid.....	via England.		—	—		—	—
		Direct.....		—	—		—	—
		via Germany.		—	—		—	—
9	Prepaid, No...	———	—	—	—	—	—	—
	Prepaid, No...	———	—	—	—	—	—	—
10	Letters from foreign countries for the United States. Unpaid.....	via England.		—	—		—	—
11		Direct.....		—	—		—	—
		via Germany.		—	—		—	—
				Spd.	Skill.		Spd.	Skill.
12	Foreign rates reclaimed by United States.	———	—			—		
13	Prepaid, No...	———	—	—	—	—	—	—
15	Letters from foreign countries for countries beyond the United States. Unpaid.....	via England.		—	—		—	—
		Direct.....		—	—		—	—
		via Germany.		—	—		—	—
				Spd.	Skill.		Spd.	Skill.
16	Foreign rates reclaimed by United States.	———	—			—		
	TABLE III. *Registered correspondence.* (See list on back hereof.)							
19	Registered articles returned. Letters, No..	———	—	—	—	—	—	—
	Prints, No...	———	—	—	—	—	—	—
	TABLE V. *Transit account.*			Grammes.			Grammes.	
25	Total rates, net weight of letters returned, to be deducted from transit account.	via England.						
		Direct.....						
26	See items 2, 3, 7, 11, 12, 15, and 16..	via Germany.						

List of Registered Articles returned. (See item 19.)

	Index number.	Addresses.
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		

THE NORWEGIAN MARINE AND POST DEPARTMENT. } C². { CORRESPONDENCE WITH THE UNITED STATES.

DEAD-LETTER BILL

Of the correspondence returned from Norway to the United States as not deliverable, for the month of ————, 187–.

List of the items of account.	Nature of the correspondence.		By what route received.	Statement by the Norwegian Office.			Verification by the United States Office.		
				No. of rates.	Amount.		No. of rates.	Amount.	
					Spd.	Sk.		Spd.	Sk.
	TABLE I. *International correspondence.*								
1	Prepaid letters, No.		———	—	—	—	—	—	—
2	Unpaid letters		via England.		—	—		—	—
			Direct		—	—		—	—
			via Germany.		—	—		—	—
3	Insufficiently paid letters.		via England.		—	—		—	—
4			Direct		—	—		—	—
5			via Germany.		—	—		—	—
		Amount of deficient postage.	———	—			—		
	TABLE II. *Extranational correspondence.*								
7	Letters from the United States for countries beyond Norway.	Unpaid	via England.		—	—		—	—
			Direct		—	—		—	—
			via Germany.		—	—		—	—
9		Prepaid, No.	———	—	—	—	—	—	—
		Prepaid, No.	———	—	—	—	—	—	—
10	Letters from foreign countries for Norway.	Unpaid	via England.		—	—		—	—
11			Direct		—	—		—	—
12			via Germany.		—	—		—	—
					Dolls.	Cts.		Dolls.	Cts.
		Foreign rates reclaimed by Norway.	———	—			—		
		Prepaid, No.	———	—	—	—	—	—	—
13	Letters from foreign countries for countries beyond Norway.	Unpaid	via England.		—	—		—	—
15			Direct		—	—		—	—
16			via Germany.		—	—		—	—
					Dolls.	Cts.		Dolls.	Cts.
		Foreign rates reclaimed by Norway.	———	—			—		
	TABLE III. *Registered correspondence.* (See list on back hereof.)								
19	Registered articles returned.	Letters, No.	———	—	—	—	—	—	—
		Prints, No.	———	—	—	—	—	—	—
					Grammes.			Grammes.	
	TABLE V. *Transit account.*								
25	Total rates net weight of letters returned to be deducted from transit account. (See items 2, 3, 7, 11, and 15)		via England.						
			Direct						
26			via Germany.						

List of Registered Articles returned. (See item 19.)

	Index number.	Addresses.
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		

D[1].

QUARTERLY ACCOUNT

Of the mails sent by the United States Exchange Office of ——— to the Norwegian Exchange Office of ———, during the quarter ending ———, 187–, via ———.

Numbers of the letter-bills.	1	2	4	5	6	7	8	9
	I. International Correspondence.					II. Extranational Correspondence.		
	Prepaid letters.	Unpaid letters.	Letters insufficiently paid.		Journals, &c.	Letters originating in the United States for transit to countries beyond Norway.		
						Unpaid.	Prepaid.	
	Number of rates.	Number of rates.	Total amount prepaid.	Total amount deficient.	Total amount prepaid.	Number of rates.	Number of rates.	Amount of foreign postage to account for to Norway.
			Spd.	Spd.	Dolls.			Dolls.
			Skill.	Skill.	Cts.			Cts.
Totals.....								
Aggregate of dead matter returned to United States.	——		—	—	——	—	—	—— —
Net totals.....			—	—	——	—		—— —
At rate of.....	10 c. 6 c.	18 sk. 10 sk.	—	—	——	—	18 sk. 10 sk.	10 c. 6 c. —— —
Sums.....			—	—	——	—		—— —

D[1].

QUARTERLY ACCOUNT

*Of the mails sent by the United States Exchange Office of ——— to the Norwegian Exchange Office of ———, during the quarter ending ———, 187–, via ——— —*Continued.

	10	11	12	13	14	15	16	17	18	19	20
	II. Extranational Correspondence.										
Number of the letter-bills.	Letters originating outside of the United States, and forwarded in the United States mail.							Prepaid journals, prints, samples, &c., originating in the United States and addressed to countries beyond Norway, or coming from countries outside of the United States and addressed to Norway or to countries beyond.		Unpaid journals, prints, and patterns of merchandise originating in foreign countries and passing in transit through the United States.	
	Addressed to Norway.			Addressed to countries beyond Norway.							
	Prep'd.	Unpaid.		Prepaid.		Unpaid.					
	Number of rates.	Number of rates.	Amount of foreign postage to account for to United States.	Number of rates.	Amount of foreign postage to account for to Norway.	Number of rates.	Amount of foreign postage to account for to United States.	Amount of the international postage.	Amount of the foreign postage to account for to Norway for countries beyond.	Amount of the international postage.	Amount of the foreign postage to be accounted for to the United States.
			Dolls. Cts.		Dolls. Cts.		Dolls. Cts.	Dolls. Cts.	Dolls. Cts.	Dolls. Cts.	Dolls. Cts.
Totals											
Aggregate of dead matter returned to United States.	—			—	— –			—	— –	—	— –
Net totals..					— –			—	— –	—	— –
At rate of.....	10 c	6 c	18 sk 10 sk	10 c	6 c — –	18 sk	10 sk	—	— –	—	— –
Sums					— –			—	— –	—	— –

D[1].

QUARTERLY ACCOUNTS

*Of the mails sent by the United States Exchange Office of ——— to the Norwegian Exchange Office of ——— , during the quarter ending ———, 187–, via ——— —*Continued.

Number of the letter-bills.	21	22	23	24	25–26	27
	III. Register Fees.		IV. Letters Resent.		V. Intermediate Transit.	
	Number of the register fees received on the registered articles sent.	Amount of the supplementary register fees to account for to Norway for the countries beyond.	Letters unpaid and prepaid wherever originating forwarded to persons who have changed their national residence.		Via ———.	
		Dolls. / Cts.	Prior postage unpaid, amount to account for to exclusive credit of the United States. Dolls. / Cts.	Expense of return. Number of rates. / Amount. Dolls. / Cts.	Letters.	Journals, &c.
Total						
Aggregate of dead matter returned to United States.	—	— —	—	— —	—	—
Net totals....		—	—	—	—	—
At rate of.....	8 c.	—	—	—	—	
Sums						

Summary of the within account.

Sums for which the United States must account for to Norway.					Sums for which Norway must account for to the United States.				
For items of the account, Nos.		Sums to be divided.		Sums wholly due to Norway.	For items of the account, Nos.		Sums to be divided.		Sums wholly due to the United States.
1			—	—	2			—	—
4			—	—	5			—	—
6			—	—	7			—	—
8			—	—	11			—	—
9	—	—			12	—	—		
10			—	—	15			—	—
13			—	—	16	—	—		
14	—	—			19			—	—
17			—	—	20	—	—		
18	—	—			23	—	—		
21			—	—	24			—	—
22	—	—							
Totals					Totals				
		—	—	—			—	—	
Deduct intermediate transit charges.	Letters, 25, 26. Journals, &c., 27. Dolls Cts				One-half (½) to United States is			—	—
		—	—	—	Total amount due United States is				
Balance to be divided is		—	—						
One-half (½) to Norway is				—	—				
Total amount due to Norway									
Total amount due to United States				—	—				
Balance due to Norway				—	—				

Dated at ——, this —— day of ——, 187-.

D.[2]

Quarterly account of the mails sent by the Norwegian Exchange Office of ——— to the United States Exchange Office of ———, during the quarter ending ———, 187—, via ———.

Numbers of the letter-bills.	1	2	4	5	6	7	8	9
	I. International Correspondence.					II. Extranational Correspondence.		
	Prepaid letters.	Unpaid letters.	Letters insufficiently paid.		Journals, &c.	Letters originating in Norway for transit to countries beyond the United States.		
	Number of rates.	Number of rates.	Total amount prepaid. Dolls.	Total amount prepaid. Cts.	Total amount deficient. Dolls.	Total amount deficient. Cts.	Total amount prepaid. Spd.	Total amount prepaid. Skill.
Totals								
Aggregate of dead matter returned to Norway.	———		—	—			——	—
Net totals.....			—	—	—	—	——	—
At rate of.....	12 sk. 7 sk.	15 c. 9 c.	—	—	—	—	——	—
Sums			—	—	—	—	——	—

Numbers of the letter-bills.	Unpaid.	Prepaid.		
	Number of rates.	Number of rates.	Amount of foreign postage to account for. Spd.	Amount of foreign postage to account for. Skill.
Totals				
Aggregate of dead matter returned to Norway.		——	——	—
Net totals.....			——	—
At rate of.....	15 c. 9 c.	12 sk. 7 sk.	——	—
Sums			——	—

D².

*Quarterly account of the mails sent by the Norwegian Exchange Office of ——— to the United States Exchange Office of ———, during the quarter ending ———, 187–, via ——— —*Continued.

Numbers of the letter-bills.	10	11	12	13	14	15	16	17	18	19	20
	II. Extranational Correspondence.										
	Letters originating outside of Norway and forwarded in the Norwegian mails.							Prepaid journals, prints, pamphlets, &c., originating in Norway and addressed to countries beyond the United States, or coming from countries outside of Norway and addressed to the United States or to countries beyond.		Unpaid journals, prints, and patterns of merchandise originating in foreign countries and passing in transit thro' Norway.	
	Addressed to the United States.			Addressed to countries beyond Norway.							
	Prepaid.	Unpaid.		Prepaid.		Unpaid.					
	Number of rates.	Number of rates.	Amount of foreign postage to account for to Norway.	Number of rates.	Amount of foreign postage to account for to United States.	Number of rates.	Amount of foreign postage to account for to Norway.	Amount of the international postage.	Amount of the foreign postage to account for to the United States for countries beyond.	Amount of the international postage.	Amount of the foreign postage to be accounted for to Norway.
			Spd. Skill.		Spd. Skill.		Spd. Skill.	Spd. Skill.	Spd. Skill.	Spd. Skill.	Spd. Skill.
Totals ..... Aggregate of dead matter returned to Norway.	——			——		—	—	—	—	—	—
Net totals			— —		— —	—	—	—	—	—	—
At rate of.....	12 sk. 7 sk.	15 c. 9 c.	— —	12 sk. 7 sk.	— —	15 c. 9 c.	— —	—	—	—	—
Sums			— —		— —		— —	—	—	—	—

D².

*Quarterly account of the mails sent by the Norwegian Exchange Office of ——— to the United States Exchange Office of ———, during the quarter ending ———, 187—, via ——— —*Continued.

	21	22	23	24	25—26	27
	III. Register Fees.		IV. Letters Resent.		V. International Transit.	
	Number of the register fees received on the registered article sent.	Amount of the supplementary register fees to account for to the United States for the countries beyond.	Letters unpaid and prepaid, wherever originating, forwarded to persons who have changed their national residence.		Via ———.	
Numbers of the letter-bills.			Prior postage unpaid.	Expense of return.	Letters.	Journals, &c.
			Amount to account for to exclusive credit of Norway.	Number of rates. Amount.		
			Spd.	Spd. Skill.		
			Skill.			
			Spd.			
			Skill.			
			Spd.	Spd. Skill.		
			Skill.			
Totals						
Aggregate of dead matter returned to Norway.	—	—	—	—	—	—
Net totals.....		—	—	—	—	—
At rate of.....	8 skill.	—	—	—	—	—
Sums						

D².

Summary of the within account.

Sums for which Norway must account for to the United States.					Sums for which the United States must account for to Norway.				
For items of the account, Nos.		Sums to be divided.	Sums wholly due to the United States.		For items of the account, Nos.		Sums to be divided.	Sums wholly due to Norway.	
	1		—	—		2		—	—
	4		—	—		5		—	—
	6		—	—		7		—	—
	8	—	—	—	—	11		—	—
	9	—	—			12	—	—	
	10		—	—		15		—	—
	13		—	—		16	—	—	
	14	—	—			19		—	—
	17		—	—		20	—	—	
	18	—	—			23	—	—	
	21		—	—		24		—	—
	22	—	—				—	—	—	—
		—	—	—	—	Totals.....				
Totals.....										
		—	—			One-half (½) to Norway, is			—	—
Deduct intermediate transit charges.	Let rs 25–26..					Total amount due to Norway, is.				
	Journals, &c. 27									
		—	—							
Balance to be divided is.....										
		—	—							
One-half (½) to United States, is ..										
Total amount due to United States				—	—					
Total amount due to Norway.....										
Balance due to the United States.				—	—					
				—	—					

Dated at ——, this —— day of ——, 187–.

POST-OFFICE DEPARTMENT OF THE UNITED STATES OF AMERICA. } E. { CORRESPONDENCE WITH NORWAY.

RECAPITULATION.

For the quarter ending ——, 187-.

Quarterly account.	Mails sent by the way of—	Net balance in favor of the United States.	Net balance in favor of Norway.
EAST.			
New York to Christiania	England		
Chicago to Christiania	do		
New York to Christiania	Direct		
Chicago to Christiania	do		
New York to Christiania	Germany		
Chicago to Christiania	do		
Etc.			
WEST.			
Christiania to New York	England		
Christiania to Chicago	do		
Christiania to New York	Direct		
Christiania to Chicago	do		
Christiania to New York	Germany		
Christiania to Chicago	do		
Etc.			
Totals			
Balance in favor of —— is			
Final balance in favor of —— is			

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, ——, 187-.

ADDITIONAL ARTICLES OF AGREEMENT BETWEEN THE POST-OFFICE DEPARTMENTS OF THE UNITED STATES OF AMERICA AND OF THE DOMINION OF CANADA, ESTABLISHING AN EXCHANGE OF POSTAL CARDS BETWEEN THE TWO COUNTRIES.

ARTICLE 1.

For the purpose of providing additional facilities of mail communication between the United States and Canada, it is hereby mutually agreed that United States postal cards mailed at any post-office in the United States and addressed to Canada, and Canadian postal cards mailed at any post-office in Canada and addressed to the United States, when prepaid an additional postage of one cent by affixing thereto an ordinary one-cent postage-stamp of the country of origin in addition to the stamp printed or impressed on the card, shall be reciprocally forwarded and delivered in the country of destination free of charge. Postal cards not so prepaid will not be forwarded in the mails between the two countries.

ARTICLE 2.

The regulations and instructions governing the use and treatment of postal cards in the domestic mails of the United States and of Canada, respectively, shall apply equally to the postal cards mailed in either country and addressed to the other country.

ARTICLE 3.

Each country will retain to its own use the postage it collects at the prescribed rate on postal cards forwarded to the other country.

ARTICLE 4.

The present articles shall be considered additional to those agreed upon between the two offices on the 25th of March, A. D. 1851, and on the 25–28 of August, 1856, and shall come into operation on the 1st day of July, A. D. 1873.

In witness whereof the Postmaster-General of the United States of America and the Postmaster-General of the Dominion of Canada have hereto set their hands and affixed their seals, at the date set opposite to each, respectively.

{Seal of P. O. Dept. U. S.}

JNO. A. J. CRESWELL,
Postmaster-General of the United States.

JUNE 19, 1873.

{Seal of P. O. Dept. Canada.}

A. CAMPBELL,
Postmaster-General of Canada.

JUNE 26, 1873.

I hereby approve the aforegoing convention, and in testimony thereof I have caused the seal of the United States to be affixed.

U. S. GRANT.

By the President:

HAMILTON FISH,
Secretary of State.

{SEAL OF U. S.}

WASHINGTON, *June* 19, 1873.

ADDITIONAL ARTICLES OF AGREEMENT BETWEEN THE POST-OFFICE DEPARTMENTS OF THE UNITED STATES OF AMERICA AND OF NEWFOUNDLAND, ESTABLISHING AN EXCHANGE OF POSTAL CARDS BETWEEN THE TWO COUNTRIES.

ARTICLE I.

For the purpose of providing additional facilities of mail communication between the United States and Newfoundland, it is hereby mutually agreed that United States postal cards mailed at any post-office in the United States and addressed to Newfoundland, and Newfoundland postal cards mailed at any post-office in Newfoundland and addressed to the United States, when prepaid an additional postage of one cent, by affixing thereto an ordinary one-cent postage-stamp of the country of origin in addition to the stamp printed or impressed on the card, shall be reciprocally forwarded and delivered in the country of destination free of charge. Postal cards not so prepaid will not be forwarded in the mails between the two countries.

ARTICLE II.

The regulations and instructions governing the use and treatment of postal cards in the domestic mails of the United States and of Newfoundland, respectively, shall apply equally to the postal cards mailed in either country and addressed to the other country.

ARTICLE III.

Eac country will retain to its own use the postage it collects at the prescribed rate on postal cards forwarded to the other country

ARTICLE IV.

The present articles shall be considered additional to those agreed upon between the two offices on the 13–20 of November, A. D. 1872, and shall come into operation on the 1st of October, A. D. 1873.

In witness whereof the Postmaster-General of the United States of America and the Postmaster-General of Newfoundland have hereto set their hands and affixed their seals, at the date set opposite to each respectively.

[SEAL.]

JNO. A. J. CRESWELL,
Postmaster-General of the United States.

AUGUST 21, 1873.

JOHN DELANEY,
Postmaster-General of Newfoundland.

SEPTEMBER 15, 1873.

I hereby approve the aforegoing convention, and in testimony thereof I have caused the seal of the United States to be affixed.

U. S. GRANT.

By the President:

W. HUNTER,
Acting Secretary of State.

{SEAL OF U. S.}

WASHINGTON, *September* 26, 1873.

ADDITIONAL ARTICLES OF AGREEMENT BETWEEN THE POST DEPARTMENT OF THE UNITED STATES OF AMERICA AND THE POST DEPARTMENT OF THE GERMAN EMPIRE, ESTABLISHING AN EXCHANGE OF POSTAL CARDS BETWEEN THE TWO COUNTRIES.

ARTICLE 1.

For the purpose of providing additional facilities of mail communication between the United States of America and the German Empire, it is hereby mutually agreed that United States postal cards mailed at any post-office in the United States and addressed to Germany, and German postal cards mailed at any post-office in Germany and addressed to the United States, the postage on which shall have been fully prepaid to destination, at the rates hereinafter stated, can henceforth be exchanged between the inhabitants of the United States and of Germany. But unpaid or insufficiently paid postal cards will not be forwarded in the mails between the two countries.

ARTICLE 2.

Postal cards shall be forwarded exclusively by means of such direct steamers as shall from time to time be employed in the transportation of the direct German-American mails.

Each of the two Post Departments shall pay the entire expenses of the sea transport for the postal cards which are sent from its territory.

For the purposes of this article, the charge for the sea transportation across the Atlantic of the postal cards sent by direct steamers from the United States to Germany is fixed at one cent an ounce, (avoirdupois,) net weight.

ARTICLE 3.

The postage on postal cards sent in each direction is fixed as follows:

1. At two cents, when sent from the United States of America.
2. At one silbergroschen, when sent from Germany.

Prepayment thereof to be made by affixing to each United States postal card an ordinary 1-cent postage-stamp in addition to the stamp printed or impressed on the card.

Each Department shall retain to its exclusive use the postage which it collects, at the prescribed rates, on the postal cards sent from its territory.

ARTICLE 4.

The regulations and instructions governing the use and treatment of postal cards in the domestic mails of the United States and of Germany, respectively, shall apply equally to the postal cards mailed in either country and addressed to the other country.

ARTICLE 5.

The regulations in the foregoing articles shall in like manner apply to the postal cards which are exchanged through the medium of the German mails between the United States of America on the one side, and the Empire of Austria, Hungary, and the Grand Duchy of Luxemburg on the other.

ARTICLE 6.

This agreement shall go into effect on the first of December, 1873, and shall have equal duration with the postal convention of 21st October, 1867, and with the additional conventions concluded thereto.

Done in duplicate and signed in Washington the 18th November, 1873, and in Berlin the 31st October, 1873.

JNO. A. J. CRESWELL, [L. S.]
Postmaster-General of the United States.

STEPHAN, [L. S.]
Director-General of Posts of Germany.

I hereby approve the aforegoing convention, and in testimony thereof I have caused the seal of the United States to be affixed.

[L. S.] U. S. GRANT.

By the President:

HAMILTON FISH,

Secretary of State.

WASHINGTON, *November* 18, 1873.

Total operations of the Appointment Office for the year ended June 30, 1873.

States and Territories.	Post-offices.				Postmasters.			Total number of changes.
	Established.	Discontinued.	Names and sites changed.	Appointments on change of name and site.	Resigned and commissions expired.	Removed.	Deceased.	
Alabama	94	42	4	3	116	34	8	298
Alaska	.....	1	.....	.....	.....	.....	.....	1
Arizona	10	4	2	.....	3	1	1	21
Arkansas	110	50	7	.....	95	35	8	305
California	59	21	6	3	76	23	6	191
Colorado	23	10	8	5	27	3	.....	71
Connecticut	16	3	2	.....	31	9	6	67
Dakota	27	5	7	3	25	6	.....	70
Delaware	7	3	3	1	5	2	1	21
District of Columbia	.....	2	.....	.....	3	.....	.....	5
Florida	25	8	2	.....	43	13	4	95
Georgia	79	40	5	1	102	20	10	256
Idaho	15	4	1	.....	8	2	1	31
Illinois	90	36	28	9	280	29	18	481
Indiana	64	37	7	3	279	39	16	442
Iowa	61	56	25	10	250	30	10	432
Kansas	178	52	41	24	214	26	6	517
Kentucky	81	57	9	4	138	49	10	344
Louisiana	54	5	3	2	61	34	6	163
Maine	15	8	8	4	58	8	11	108
Maryland	22	6	11	7	65	10	6	120
Massachusetts	11	14	5	2	43	5	11	89
Michigan	60	33	15	8	153	29	21	311
Minnesota	76	34	9	2	133	34	8	294
Mississippi	62	5	3	3	64	18	7	159
Missouri	104	86	17	5	248	55	16	526
Montana	8	3	1	1	19	4	2	37
Nebraska	80	23	16	10	81	14	.....	214
Nevada	20	8	5	1	14	2	.....	49
New Hampshire	15	8	3	1	44	8	11	89
New Jersey	28	2	7	1	56	10	3	106
New Mexico	8	7	.....	.....	2	3	1	21
New York	62	25	18	5	229	91	33	458
North Carolina	107	48	11	5	124	37	11	338
Ohio	71	39	25	9	295	36	23	489
Oregon	29	10	13	7	62	6	1	121
Pennsylvania	111	36	27	16	400	42	26	642
Rhode Island	.....	.....	.....	1	.....	10	1	.....	12
South Carolina	52	23	4	2	57	15	5	156
Tennessee	78	61	10	4	177	32	17	375
Texas	136	41	9	6	150	42	8	386
Utah	15	2	7	4	15	6	1	46
Vermont	5	1	.....	.....	41	7	4	58
Virginia	135	50	19	6	225	36	29	494
Washington	24	7	2	1	16	1	.....	50
West Virginia	73	35	8	6	95	16	4	231
Wisconsin	56	27	10	8	160	21	16	290
Wyoming	6	3	1	1	10	1	.....	21
Total	2,462	1,081	425	193	4,802	945	386	10,101

Table showing the increase and decrease of post-offices in the several States and Territories, also the number of post-offices at which appointments are made by the President and by the Postmaster-General, for the year ended June 30, 1873.

States and Territories.	Whole number of post-offices in the United States June 30, 1872.	Whole number of post-offices in the United States June 30, 1873.	Increase.	Decrease.	Number of postmasters appointed by the President June 30, 1872.	Number of postmasters appointed by the President June 30, 1873.	Increase.	Decrease.	Number of postmasters appointed by the Postmaster-General June 30, 1872.	Number of postmasters appointed by the Postmaster-General June 30, 1873.	Increase.	Decrease.
Alabama	635	687	52	....	11	14	3	....	624	673	49	....
Alaska	4	3	.....	1	.....	.....	....	....	4	3	.....	1
Arizona	31	37	6	....	1	1	.....	....	30	36	6	....
Arkansas	565	625	60	....	5	5	.....	....	560	620	60	....
California	592	630	38	....	20	23	3	....	572	607	35	....
Colorado	132	145	13	....	7	9	2	....	125	136	11	....
Connecticut	415	428	13	....	35	41	6	....	380	387	7	....
Dakota	77	99	22	...	1	2	1	....	76	97	21	....
Delaware	98	102	4	....	4	4	.....	....	94	98	4	....
Dist. of Columbia	7	5	.....	2	2	2	.....	....	5	3	.....	2
Florida	170	187	17	....	5	6	1	....	165	181	16	....
Georgia	548	587	39	....	20	22	2	....	528	565	37	....
Idaho	42	53	11	....	2	2	.....	....	40	51	11	....
Illinois	1,738	1,792	54	....	110	122	12	....	1,628	1,670	42	....
Indiana	1,418	1,445	27	....	49	57	8	....	1,369	1,388	19	....
Iowa	1,309	1,314	5	....	54	65	11	....	1,255	1,249	.....	6
Kansas	761	887	126	....	27	33	6	....	734	854	120	....
Kentucky	985	1,009	24	....	22	24	2	....	963	985	22	....
Louisiana	270	319	49	....	6	7	1	....	264	312	48	....
Maine	838	845	7	....	23	24	1	....	815	821	6	....
Maryland	553	569	16	....	9	12	3	....	544	557	13	....
Massachusetts	702	699	.....	3	82	102	20	....	620	597	.....	23
Michigan	1,101	1,128	27	....	56	63	7	....	1,045	1,065	20	....
Minnesota	702	744	42	....	18	19	1	....	684	725	41	....
Mississippi	443	500	57	....	17	22	5	....	426	478	52	....
Missouri	1,436	1,454	18	....	37	44	7	....	1,399	1,410	11	....
Montana	96	101	5	....	4	4	....	....	92	97	5	....
Nebraska	372	429	57	....	7	8	1	....	365	421	56	....
Nevada	70	82	12	....	7	8	1	....	63	74	11	....
New Hampshire	414	421	7	....	19	24	5	....	395	397	2	....
New Jersey	600	626	26	....	39	44	5	....	561	582	21	....
New Mexico	47	48	1	....	2	2	.....	....	45	46	1	....
New York	2,757	2,794	37	....	146	152	6	....	2,611	2,642	31	....
North Carolina	838	897	59	....	11	10	.....	1	827	887	60	....
Ohio	2,095	2,127	32	....	88	100	12	....	2,007	2,027	20	....
Oregon	220	239	19	....	2	5	3	....	218	234	16	....
Pennsylvania	2,964	3,039	75	....	106	116	10	....	2,858	2,923	65	....
Rhode Island	107	107	.....	....	10	10	.....	....	97	97	.....	....
South Carolina	391	420	29	....	8	13	5	....	383	407	24	....
Tennessee	930	947	17	....	14	17	3	....	916	930	14	....
Texas	654	749	95	....	20	25	5	...	634	724	90	....
Utah	155	168	13	....	3	3	....	...	152	165	13	....
Vermont	471	475	4	....	18	19	1	...	453	456	3	....
Virginia	1,185	1,270	85	....	20	21	1	...	1,165	1,249	84	....
Washington	109	126	17	....	2	2	....	....	107	124	17	....
West Virginia	658	696	38	....	5	8	3	....	653	688	35	....
Wisconsin	1,128	1,157	29	....	43	45	2	....	1,085	1,112	27	....
Wyoming	30	33	3	....	3	2	.....	1	27	31	4	....
Total	31,863	33,244	1,387	6	1,200	1,363	165	2	30,663	31,881	1,250	32

Statement of the operations of the letter-carrier system for the year ending June 30, 1873.

Name of post-office.	State.	Number of carriers.	Delivered.			Collected.		Pieces handled.		Cost of service.			Amount of local postage.
			Mail letters.	Local letters.	Newspapers.	Letters.	Newspapers.	Aggregate.	Per carrier.	Aggregate, including incidentals.	Per piece.	Per carrier.	
											Mills.		
Albany	New York	25	2,521,809	224,570	790,033	1,997,877	144,194	5,678,483	227,139	$21,796 69	3.8	$871 87	$7,106 38
Allegheny	Pennsylvania	9	783,930	89,299	443,752	362,909	30,645	1,710,535	190,059	7,474 31	4.3	830 48	4,383 61
Baltimore	Maryland	59	5,028,389	694,075	1,210,477	4,292,833	181,401	11,407,175	193,342	58,403 95	5.3	989 90	20,220 08
Boston	Massachusetts	70	6,708,679	2,173,386	1,877,124	9,597,880	649,719	21,006,779	300,097	67,529 58	3.2	964 71	64,841 21
Brooklyn	New York	46	2,945,049	849,139	1,352,202	1,547,182	95,986	6,789,558	147,599	45,006 78	6.6	978 41	22,508 44
Buffalo	do	32	2,814,831	413,318	1,206,339	1,978,139	197,855	6,210,482	194,077	31,585 01	5.0	987 03	8,871 46
Cambridge	Massachusetts	4	542,333	48,180	113,803	143,559	7,911	855,786	213,946	3,921 50	4.5	980 37½	963 80
Cambridgeport	do	4	420,075	25,366	190,348	192,817	4,312	832,918	208,229	3,250 65	3.9	812 66	581 40
Charlestown	do	5	560,254	26,141	228,904	284,748	19,957	1,120,004	224,001	4,461 41	3.9	892 28	679 04
Chicago	Illinois	111	14,420,442	2,473,265	3,193,490	19,923,270	5,128,431	45,138,898	406,656	108,873 28	2.4	980 66	47,793 74
Cincinnati	Ohio	50	4,732,360	845,277	1,061,410	3,571,425	262,231	10,472,703	209,454	51,245 81	4.8	1,024 91	26,109 12
Cleveland	do	26	2,885,763	352,235	1,029,247	2,248,725	190,668	6,706,638	257,944	24,130 38	3.2	928 09	8,487 02
Dayton	do	12	948,035	81,262	443,681	805,946	185,328	2,464,252	205,354	9,583 52	3.0	798 62	1,989 01
Detroit	Michigan	25	3,534,113	388,551	1,244,324	1,925,460	151,944	7,244,392	289,776	22,904 25	3.1	916 17	7,629 80
Erie	Pennsylvania	6	535,258	55,098	413,123	210,971	10,620	1,225,070	204,178	5,669 93	4.6	944 99	1,689 68
Harrisburgh	do	4	368,952	23,375	167,024	145,410	6,716	711,477	177,869	3,287 75	4.6	821 94	1,261 35
Hartford	Connecticut	11	878,700	112,504	348,743	449,787	24,398	1,814,132	164,921	8,329 40	4.0	757 21	5,513 23
Indianapolis	Indiana	19	2,022,143	208,680	635,026	1,439,981	238,236	4,544,066	239,161	15,708 97	3.4	826 79	3,963 70
Jersey City	New Jersey	6	684,543	65,321	164,037	282,282	33,241	1,229,424	204,904	5,500 00	4.4	916 66	1,652 86
Lancaster	Pennsylvania	5	407,520	23,819	179,876	128,868	8,199	748,282	149,656	4,212 75	5.6	842 55	589 07
Lawrence	Massachusetts	6	544,873	30,140	358,092	507,775	15,198	1,456,078	242,679	6,165 25	4.2	1,027 54	763 44
Louisville	Kentucky	26	2,987,639	330,860	739,116	2,005,848	185,512	6,248,975	240,345	25,561 99	4.0	983 11	6,900 40
Lowell	Massachusetts	6	642,663	38,680	259,427	699,049	49,861	1,689,680	281,613	4,402 00	2.6	733 66	1,082 69
Lynn	do	7	497,704	32,013	243,432	370,559	34,768	1,178,476	168,353	5,708 85	4.8	815 58	999 81
Manchester	New Hampshire	6	512,913	24,637	327,559	265,759	33,915	1,164,783	194,130	5,468 24	4.6	911 37	690 85
Memphis	Tennessee	12	1,413,791	123,237	329,232	905,104	52,915	2,824,879	235,406	9,112 32	3.2	759 36	1,531 12
Milwaukee	Wisconsin	22	2,414,200	166,762	603,324	1,406,842	131,238	4,722,366	214,653	21,257 75	4.5	966 26	5,195 00
Nashville	Tennessee	9	952,558	63,719	352,985	480,736	26,136	1,876,134	208,459	8,088 11	4.3	898 65	1,988 34
Newark	New Jersey	21	1,652,790	363,567	701,868	1,013,966	52,446	3,784,637	180,220	21,165 75	5.5	1,003 13	7,593 29
New Bedford	Massachusetts	5	451,948	21,552	222,229	259,073	13,793	968,595	193,719	4,321 23	4.4	864 25	1,062 42
New Haven	Connecticut	11	678,249	142,008	342,669	480,022	25,598	1,668,546	151,686	9,412 75	5.6	854 79	4,609 98
New Orleans	Louisiana	45	1,965,537	302,000	973,707	2,851,114	475,984	6,568,342	145,963	34,910 94	5.3	775 79	7,836 94
New York	New York	317	29,122,797	16,869,437	6,252,661	36,079,295	2,583,658	90,907,848	286,775	303,782 59	3.3	958 30	577,039 69
Philadelphia	Pennsylvania	177	14,226,773	7,428,836	5,580,860	18,014,644	2,374,704	47,625,817	267,942	184,761 95	3.8	1,043 85	166,200 60
Pittsburgh	do	24	1,964,624	296,827	744,769	1,574,644	81,582	4,662,446	194,268	19,290 40	4.1	803 76	9,808 05
Portland	Maine	10	578,924	39,146	384,861	743,191	47,721	1,793,843	179,384	8,299 80	4.6	829 98	2,289 45
Providence	Rhode Island	15	953,480	194,605	420,064	444,690	15,253	2,028,092	135,206	12,344 59	6.0	822 97	10,105 30
Reading	Pennsylvania	4	500,583	47,478	226,254	270,396	10,874	1,055,585	263,896	5,638 91	5.3	1,409 72	1,160 57
Richmond	Virginia	14	1,199,294	82,214	388,078	666,065	63,921	2,399,572	171,389	10,186 69	4.2	727 62	2,384 62
Rochester	New York	19	2,238,814	156,164	1,031,005	1,297,534	144,609	4,868,126	256,217	17,107 01	3.5	900 36	6,233 50

Saint Louis	Missouri	64	10,142,547	944,155	1,831,895	6,290,311	559,053	19,767,961	308,874	64,302 26	3.2	1,004 75	19,861 67
Salem	Massachusetts	6	335,803	37,603	203,727	279,129	13,531	869,793	144,965	4,910 46	5.6	818 41	882 13
San Francisco	California	24	1,290,201	277,355	466,261	2,079,732	236,795	4,350,344	181,264	25,095 94	5.7	1,045 66	10,163 48
Syracuse	New York	15	1,576,532	175,382	668,490	892,584	158,374	3,471,362	231,424	13,161 98	3.7	877 46	3,507 64
Trenton	New Jersey	4	447,201	37,900	182,777	283,714	12,821	964,413	241,103	3,457 08	3.5	864 27	1,180 64
Toledo	Ohio	10	1,026,829	63,563	423,505	953,843	140,903	2,608,643	260,864	9,124 20	3.4	912 42	2,042 26
Troy	New York	15	1,644,663	209,928	589,121	1,129,586	143,957	3,717,255	247,817	11,845 32	3.1	789 68	5,130 09
Utica	do	12	1,007,754	110,163	419,037	783,636	60,801	2,381,391	198,432	10,829 37	4.5	902 44	1,995 74
Washington	District of Columbia	30	1,968,668	312,949	874,034	1,463,268	184,238	4,803,157	160,105	29,332 58	6.1	977 75	7,216 92
Williamsburgh	New York	14	952,500	82,962	380,821	348,407	29,602	1,794,292	128,164	11,281 50	6.2	805 82	1,659 24
Wilmington	Delaware	10	711,523	85,650	280,977	353,877	16,874	1,448,901	144,890	8,278 57	5.7	827 86	3,052 08
Worcester	Massachusetts	10	611,334	75,096	294,865	341,237	11,746	1,334,278	133,427	8,081 33	6.0	808 13	3,508 16
Total		1,499	140,958,887	38,340,049	43,390,665	137,065,699	15,560,373	374,915,664	.....	1,419,563 63	.....	.....	1,112,251 21
Salary of special agent of Post-Office Department paid out of the appropriation for letter-carriers										2,720 35			
Amount paid for letter-boxes at Des Moines, Iowa; Oswego, N. Y.; Scranton, Pa.; Wilkesbarre, Pa.; Quincy, Ill.; not included above										211 50			
Total										1,422,495 48			

TELEGRAPHS, 1.

Comparative statistics of the different states of Europe.—Furnished by L. Curchord, director of telegraphs of Switzerland.

Object of the statistics.	Germany.	Austria.	Hungary.	Bavaria.	Belgium.	Denmark.	Spain.	France.	Great Britain.	Greece.
	1872.	1871.	1872.	1871.	1872.	1871.	1872.	1871.	1872.	1871.
Length of lines.....kilometers.	28, 485. 38	18, 864	12, 550	6, 735	4, 602	2, 393	11, 754	43, 811	38, 512. 8	1, 740
Extent of the wires.....do..	98, 089. 43	61, 681. 1	42, 474	21, 805	17, 656	6, 175	26, 728	122, 652	161, 157. 8	1, 970
Number of apparatus.....	3, 293	1, 139	1, 081	1, 097	910	196	408	1, 984	7, 542	70
Cost of lines and apparatus up to the year .....francs	22, 180, 689. 12	25, 954	615. 86	4, 614, 095. 74	3, 118, 952. 00	3, 616, 490. 16	5, 248, 757. 25	30, 800, 822. 69	.....	1, 389, 135. 00
Number of offices	3, 058	1, 512	764	714	522	163	215	3, 271	5, 474	41
Number of employés.....	5, 569	2, 141	1, 405	297	1, 580	353	1, 826	5, 129	10, 576	248
Interior dispatches	6, 783, 533	2, 344, 995	2, 016, 001	438, 782	1, 589, 344	228, 287	1, 021, 751	4, 371, 952	15, 535, 780	117, 516
International dispatches sent ..	1, 443, 972	582, 952	82, 995	259, 844	310, 261	98, 924	93, 528	805, 964	1, 002, 216	10, 418
International dispatches received	1, 554, 079	535, 882	87, 344	287, 083	350, 262	98, 620	102, 315	772, 411	869, 107	12, 812
International dispatches in transit	354, 739	463, 406	170, 522	309, 247	157, 496	113, 584	37, 049	1, 254, 643	.....	.....
Total international dispatches .	3, 352, 790	1, 582, 240	340, 861	856, 174	818, 019	311, 128	232, 892	1, 578, 375	1, 871, 323	23, 230
Total interior and international dispatches.....	10, 136, 323	3, 927, 235	2, 356, 862	1, 294, 956	2, 407, 363	539, 415	1, 254, 643	5, 950, 327	17, 407, 103	140, 746
RECEIPTS.										
Product of interior dispatches, francs.....	6, 521, 869. 00	3, 029, 755. 00	2, 493, 213. 80	437, 787. 50	867, 448. 25	219, 292. 50	1, 032, 235. 00	4, 494, 823. 55	19, 929, 125. 00	182, 672. 00
Product of international and transit dispatches.....francs.	5, 469, 499. 00	2, 144, 422. 00	281, 350. 10	550, 538. 85	903, 598. 75	362, 440. 25	742, 179. 00	3, 939, 502. 98	4, 414, 975. 00	33, 560. 00
Total product of dispatches do..	11, 991, 364. 00	5, 174, 177. 00	2, 774, 563. 90	988, 326. 35	1, 771, 047. 00	581, 732. 75	1, 774, 414. 00	8, 434, 326. 53	24, 344, 100. 00	216, 232. 00
Sundries .....do..	127, 781. 00	1, 120, 242. 00	127, 540. 90	9, 645. 00	2, 184. 90	3, 468. 50	.....	.....	1, 097, 550. 00	.....
Total	12, 119, 145. 00	6, 294, 419. 00	2, 902, 104. 80	997, 971. 35	1, 773, 231. 90	585, 201. 25	1, 774, 414. 00	8, 434, 326. 53	25, 441, 650. 00	216, 232. 00
EXPENSES.										
Salaries..... francs.	8, 391, 745. 00	3, 770, 552. 00	2, 264, 598. 35	363, 986. 70	1, 100, 659. 00	381, 954. 25	2, 959, 500. 00	9, 620, 000. 00 }	22, 842, 225. 00	{ 243, 715. 00
Maintenance and supplies .do..	3, 534, 713. 00	3, 316, 548. 00	2, 414, 398. 52	238, 900. 00	759, 300. 00	153, 419. 00	529, 880. 00	2, 950, 000. 00 }		} 70, 480. 00
Total	11, 926, 458. 00	7, 087, 100. 00	4, 678, 996. 87	602, 894. 70	1, 859, 959. 00	535, 373. 25	3, 489, 380. 00	12, 570, 000. 00	22, 842, 225. 00	324, 195. 00

Comparative statistics of different states of Europe, &c.—Continued.

Object of the statistics.	Italy.	Norway.	Netherlands.	Portugal.	Roumania.	Russia.	Sweden.	Switzerland.	Turkey.	Würtemberg.
	1871.	1871.	1872.	1871.	1870.	1872.	1872.	1872.	1870.	1871.
Length of lines.....kilometers	18, 601	6, 333. 6	3, 288	3, 111. 50	3, 319	56, 312	7, 049	5, 529. 4	25, 487	2, 150. 8
Extent of the wires.....do..	59, 940	9, 418. 7	11, 276	5, 725	4, 369	111, 061	18, 058	12, 639. 5	42, 482	4, 586. 9
Number of apparatus	1, 359	237	345	187	140	1, 565	636	955	1, 285	335
Cost of lines and apparatus up to the year .....francs.	.....	5, 135, 885. 04	5, 475, 442. 09	1, 361, 174. 41	.....	33, 960, 103. 96	7, 483, 573. 00	2, 399, 038. 38	.....	1, 587, 937. 00
Number of offices	1, 202	147	282	116	65	1, 333	320	707	393	206
Number of employés.....	2, 834	538	914	646	966	5, 481	531	1, 134	2, 536	115
Interior dispatches.....	2, 303, 117	300, 365	1, 217, 837	181, 776	431, 892	2, 551, 703	563, 819	1, 498, 285	640, 063	197, 904
International dispatches sent..	298, 930	78, 595	274, 728	28, 373	73, 885	246, 030	111, 783	251, 707	80, 563	138, 969
International dispatches received	311, 367	91, 982	310, 223	29, 228	71, 737	250, 679	113, 211	246, 597	85, 477	156, 734
International dispatches in transit	154, 283	22, 247	215, 885	49, 856	14, 240	27, 577	62, 601	150, 158	19, 290	55, 837
Total international dispatches	764, 580	192, 824	800, 836	107, 457	159, 862	524. 286	287, 595	648, 462	185, 330	351, 540
Total interior and international dispatches.....	3, 067, 697	493, 209	2, 018, 673	289, 233	592, 754	770, 316	851, 414	2, 146, 747	825, 393	549, 444
RECEIPTS.										
Product of interior dispatches, francs.....	3, 198, 061. 75	498, 014. 00	790, 613. 41	185, 958. 25	805, 266. 10	13, 883, 353. 18	827, 440. 00	1, 569, 605. 31	4, 800, 231. 90	170, 845. 00
Product of international and transit dispatches.....francs	1, 897, 729. 65	346, 883. 24	560, 355. 41	138, 634. 00	259, 862. 00	2, 958, 745. 60	641, 313. 00		1, 250, 690. 00	209, 320. 00
Total product of dispatches do..	5, 095, 791. 40	834, 897. 24	1, 350, 968. 82	324, 592. 25	1, 065, 128. 10	16, 842, 098. 78	1, 468, 753. 00	1, 569, 605. 31	6, 050, 921. 90	380, 165. 00
Sundries .....do..	120, 176. 06	10, 336. 41	.....	11, 299. 02	.....	278, 110. 40	308, 156. 00	105, 572. 06	57, 806. 00	19, 279. 00
Total	5, 215, 967. 46	855, 233. 65	1, 350, 968. 82	335, 891. 27	1, 065, 128. 10	17, 120, 208. 64	1, 776, 909. 00	1, 675, 177. 37	6, 108, 727r90	399, 441. 00
EXPENSES.										
Salaries .....francs	3, 422, 245. 62	497, 026. 80	1, 260, 931. 94	641, 130. 95	1, 434, 144. 00	7, 412, 941. 24	810, 126. 00	880, 597. 50	3, 677, 028. 50	223, 832. 00
Maintenance and supplies .do..	943, 389. 34	307, 421. 78	713, 729. 12	183, 213. 91	50, 000. 00	5, 499, 992. 78	284, 020. 00	292, 099. 64	694, 059. 40	162, 379. 00
Total	4, 365, 634. 96	804, 448. 58	1, 974, 661. 06	824, 344. 86	1, 484, 144. 00	12, 912, 934. 02	1, 094, 146. 00	1, 272, 697. 14	4, 371, 087. 90	386, 211. 00

TELEGRAPHS, 2.

Table showing, to the nearest thousand, the number of messages (exclusive of press and news messages) forwarded from postal-telegraph stations in the United Kingdom during each month of 1871 *and* 1872.

Month.	Number of messages.		Increase.
	1871.	1872.	
January	772,000	1,055,000	283,000
February	751,000	1,014,000	263,000
March	929,000	1,096,000	167,000
April	831,000	1,221,000	390,000
May	970,000	1,233,000	263,000
June	1,003,000	1,195,000	192,000
July	1,115,000	1,385,000	270,000
August	1,153,000	1,466,000	313,000
September	1,055,000	1,393,000	338,000
October	1,176,000	1,371,000	195,000
November	1,027,000	1,324,000	297,000
December	978,000	1,105,000	127,000
Total	11,760,000	14,858,000	3,098,000

TELEGRAPHS, 3.

ENGLAND.—POST-OFFICE TELEGRAPHS.

Statement (compiled from weekly statements of British post department) showing the total number of messages forwarded from postal-telegraph stations in the United Kingdom during the period commencing January 4, 1873, *and ending September* 27, 1873, *and during the corresponding weeks of* 1872.

Week ended—	Total No. of messages.	Week ended—	Total No. of messages.	Increase in the week of 1873 over that of 1872.	Total increase in the month of 1873 over that of 1872.	
					Month.	Increase.
Jan. 4, 1873	256,035	Jan. 6, 1872	217,518	38,517		
11, 1873	275,341	13, 1872	239,424	35,917	January	172,322
18, 1873	283,679	20, 1872	238,223	45,456		
25, 1873	289,173	27, 1872	236,741	52,432		
Feb. 1, 1873	290,161	Feb. 3, 1872	246,332	43,829		
8, 1873	293,990	10, 1872	250,776	43,214	February	193,459
15, 1873	292,447	17, 1872	240,694	51,753		
22, 1873	297,079	24, 1872	243,016	54,663		
Mar. 1, 1873	301,131	Mar. 2, 1872	235,259	65,872		
8, 1873	315,669	9, 1872	251,004	64,665		
15, 1873	312,147	16, 1872	252,432	59,715	March	311,979
22, 1873	305,508	23, 1872	273,643	31,865		
29, 1873	330,551	30, 1872	240,689	89,862		
April 5, 1873	326,563	April 6, 1872	257,819	68,744		
12, 1873*	292,506	13, 1872*	279,205	13,301	April	172,506
19, 1873†	311,323	20, 1872†	275,349	35,974		
26, 1873	325,327	27, 1872	270,840	54,487		
May 3, 1873	327,890	May 4, 1872	276,493	51,397		
10, 1873	329,382	11, 1872	280,159	49,223	May	294,115
17, 1873	337,038	18, 1872	279,559	57,479		
24, 1873	330,936	25, 1872	246,761	84,175		
31, 1873	340,241	June 1, 1872	288,400	51,841		
June 7, 1873‡	304,539	8, 1872‡	286,687	17,852		
14, 1873	339,772	15, 1872	298,957	40,815	June	139,426
21, 1873	341,551	22, 1872	304,289	37,262		
28, 1873	348,338	29, 1872	304,841	43,497		
July 5, 1873	342,405	July 6, 1872	294,496	47,909		
12, 1873	351,252	13, 1872	308,746	42,506	July	204,094
19, 1873	361,789	20, 1872	304,853	56,936		
26, 1873	368,828	27, 1872	312,085	56,743		
Aug. 2, 1873	376,674	Aug. 3, 1872	330,590	46,084		
9, 1873	369,451	10, 1872	320,555	48,896		
16, 1873	381,196	17, 1872	329,478	51,718	August	228,620
23, 1873	365,484	24, 1872	329,201	36,283		
30, 1873	366,559	31, 1872	320,920	45,639		
Sept. 6, 1873	361,572	Sept. 7, 1872	322,806	38,766		
13, 1873	372,024	14, 1872	327,202	44,822	September	172,743
20, 1873	358,507	21, 1872	321,478	37,029		
27, 1873	366,346	28, 1872	314,220	52,126		
Total....	12,841,004	Total	10,951,740	1,889,264	Total inc. in 9 mos	1,889,264

* Good Friday this week. † Easter holidays this week. ‡ Whitsuntide holidays.

TELEGRAPHS, 4.

Statement compiled from weekly reports of British post-office department, showing the total number of messages forwarded from postal-telegraph stations in the United Kingdom each month during the period commencing January 4, 1873, *and ending September* 27, 1873, *and during the corresponding months of* 1872.

Month.	In 1873.	In 1872.	Increase each month in 1873 over that of 1872.
	Total number of messages.	Total number of messages.	
January	1,104,228	931,906	172,322
February	1,174,277	980,818	193,459
March	1,565,006	1,253,027	311,979
April	1,255,719	1,083,213	*172,506
May	1,665,487	1,371,372	294,115
June	1,334,200	1,194,774	†139,426
July	1,424,274	1,220,180	204,094
August	1,859,364	1,630,744	228,620
September	1,458,449	1,285,706	172,743
Total	12,841,004	10,951,740	1,889,264

* Good Friday and also the Easter holidays were in this month.
† Whitsuntide holidays were in this month.

NOTE.—The above remarks appear in reports of the British office as a reason, it is presumed, for the small increase in each month.

REPORT OF THE AUDITOR OF THE TREASURY FOR THE POST-OFFICE DEPARTMENT.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
October 20, 1873.

SIR: I have the honor to submit the following annual report of the receipts and expenditures of the Post-Office Department, together with the operations of this office in connection therewith, for the fiscal year ended June 30, 1873:

COLLECTION OF POST-OFFICE REVENUES.

The number of post-offices in operation during the year was 33,513, which are thus classified under the regulations adopted for the government of the Department, chapter 25, sections 352 to 368, inclusive.

The following-named offices, seventy-one in number, are denominated depositories, and are required by the Postmaster-General to receive and retain, subject to the drafts of the Department, the funds of certain adjacent offices, as well as the revenues of their own:

List of offices designated as depositories, with names of postmasters.

Albany, N. Y.	J. F. Smyth.
Atlanta, Ga.	J. L. Dunning.
Bangor, Me.	A. B. Farnham.
Batavia, N. Y.	William Tyrrell.
Binghamton, N. Y.	E. B. Stephens.
Buffalo, N. Y.	J. M. Schermerhorn.
Cleveland, Ohio	John W. Allen.
Columbus, Ohio	James M. Comley.
Concord, N. H.	M. T. Willard.
Davenport, Iowa	Edward Russell.
Des Moines, Iowa	J. S. Clarkson.
Detroit, Mich	F. W. Swift.
Dover, Del.	J. B. Smith.
Dubuque, Iowa	G. L. Torbert.
Easton, Pa.	J. K. Dawes.
Evansville, Ind	T. R. McFerson.
Fort Wayne, Ind	J. J. Kamm.
Geneva, N. Y.	Charles L. Hemiup.
Grand Rapids, Mich.	A. B. Turner.
Harrisburgh, Pa.	George Bergner.
Hartford, Conn	John H. Burnham.
Huntsville, Ala	J. D. Sibley.
Indianapolis, Ind	W. R. Holloway.
Kalamazoo, Mich	J. A. Stone.
Keene, N. H.	H. C. Henderson.
Knoxville, Tenn	William Rule.
Lafayette, Ind	J. L. Miller.
Lancaster, N. H.	John W. Spalding.
Leavenworth, Kans.	J. Clark.
Lexington, Ky	S. W. Price.
Lima, Ohio	C. Parmenter.
Louisville, Ky	L. M. Porter.
Lowell, Mass	J. A. Goodwin.
Madison, Wis	E. W. Keyes.
Meadville, Pa	D. V. Derrickson.
Memphis, Tenn	J. Deloach.
Milwaukee, Wis	S. C. West.
Mobile, Ala	M. D. Wickersham.
Montpelier, Vt	J. W. Clark.
Nashville, Tenn	W. F. Prosser.
Newark, N. J	William Ward.
New Haven, Conn	N. D. Sperry.
Ogdensburgh, N. Y.	R. G. Pettibone.
Olean, N. Y.	J. G. Johnson.
Peoria, Ill	D. W. Magee.
Pittsburgh, Pa.	J. H. Stewart.
Plattsburgh, N. Y.	H. S. Ransom.
Portland, Me.	C. W. Goddard.
Portsmouth, Ohio	O. Wood.
Providence, R. I.	E. S. Jackson.
Quincy, Ills.	M. Piggott.
Raleigh, N. C.	W. W. Holden.
Richmond, Va.	E. L. Van Lew.
Ripon, Wis.	H. S. Town.
Rochester, N. Y.	E. M. Smith.
Rutland, Vt.	J. B. Kilborn.
Sandusky, Ohio	A. C. Van Tine.
Scranton, Pa.	J. S. Slocum.
Springfield, Ill	J. L. Crane.
Springfield, Mass.	H. C. Lee.
Steubenville, Ohio	J. M. Reede.
Saint Paul, Minn.	J. A. Wheelock.
Syracuse, N. Y.	D. H. Bruce.
Urbana, Ohio	D. C. Hilt.
Utica, N. Y.	C. H. Hopkins.
Vincennes, Ind	W. N. Denny.
Wheeling, W. Va.	C. J. Rawlings.
Williamsport, Pa.	Robert Hawley.
Wooster, Ohio	A. L. McClure.
Worcester, Mass.	Josiah Pickett.
Zanesville, Ohio	J. J. Douglas

The following depositaries and assistant treasurers receive and retain, subject to the warrants of the Post-Office Department, the funds of such post-offices as are instructed to deposit in their hands:

DESIGNATED DEPOSITARIES.

S. J. Holley	Buffalo, N. Y.	J. Cushman	Olympia, W. T.
E. W. Little	Santa Fé, N. M.	Thomas Steel	Pittsburgh, Pa.
J. P. Luce	Louisville, Ky.	C. H. Lorde	Tucson, Ariz

ASSISTANT TREASURERS.

Thomas Hillhouse	New York, N. Y.	J. D. Geddings	Charleston, S. C.
George Eyster	Philadelphia, Pa.	W. E. Davis	Cincinnati, Ohio.
Peter Negley	Baltimore, Md.	J. D. Webster	Chicago, Ill.
F. Haven, jr.	Boston, Mass.	A. G. Edwards	Saint Louis, Mo.
B. F. Flanders	New Orleans, La.	William Sherman	San Francisco, Cal.

One hundred and eighty-seven post-offices are draft-offices, and during the year paid 18,898 drafts issued by the Postmaster-General, countersigned, entered, and sent out by the Auditor, for sums in the aggregate of		$2,754,891 63
Thirty-seven hundred and two offices are deposit-offices, a portion of which, during the year, deposited with the Treasurer and assistant treasurers of the United States the sum of		4,339,628 21
The remaining deposit-offices deposited with the depositaries named above, the sum of $820,086.67, which is embraced in the $2,754,891.63 paid on the drafts of the Department by said depositaries and draft-offices.		
Twenty-seven thousand nine hundred and twenty-one offices are collection offices, and paid on collection orders issued to mail-contractors the sum of		3,013,962 99
Forty-seven hundred and seventy-two offices are special and mail-messenger offices, and derive their mail supplies by the payment of the revenue of their offices therefor, amounting to		514,116 08
The amount paid into the Treasury by postmasters for the use and purposes of the Post-Office Department during the fiscal year was		10,622,598 91

Revenue account of the Post-Office Department.

The receipts of the Department for the fiscal year ended June 30, 1873, were		$22,996,741 57
The amount placed in the Treasury for the service of the Department for the fiscal year, being grants in aid of the revenue under the following acts of Congress, were:		
Under the third section of the act approved June 1, 1872, for mail-steamship service between San Francisco, Japan and China	$500,000 00	
Under the third section of the act approved June 1, 1872, for mail-steamship service between the United States and Brazil	150,000 00	
Under the third section of the act approved June 1, 1872, for mail-steamship service between San Francisco and the Sandwich Islands	75,000 00	
Under the second section of the act approved March 3, 1869, for supplying deficiency in the revenue of the Post-Office Department for the fiscal year ended June 30, 1870	152,225 00	
Under the first section of the act approved March 3, 1871, for supplying deficiency in the revenue of the Post-Office Department for the fiscal year ended June 30, 1871	978,000 00	
Under the third section of the act approved March 3, 1871, for supplying deficiency in the revenue of the Post-Office Department for the fiscal year ended June 30, 1872	535,000 00	

Under the fourth section of the act approved June 1, 1872, for supplying deficiency in the revenue of the Post-Office Department for the fiscal year ended June 30, 1873	$3,600,250 00	
		$5,990,475 00
Aggregate of revenue and grants		28,987,216 57
The expenditures of the Department for the fiscal year ended June 30, 1873, were		29,084,945 67
Excess of expenditures		97,729 10

The net revenue of the Department from postages, being the aggregate of balances due the United States by postmasters on the adjustment of their quarterly accounts for the year, after deducting their compensation and expenses of their offices, was:

For the quarter ended September, 30, 1872	$3,158,463 32
For the quarter ended December 31, 1872	3,397,009 59
For the quarter ended March 31, 1873	3,618,911 48
For the quarter ended June 30, 1873	3,529,552 66
Total	13,703,937 05

The amount of newspaper and pamphlet postage paid in money, was:

For the quarter ended September 30, 1872	$264,722 72
For the quarter ended December 31, 1872	264,149 53
For the quarter ended March 31, 1873	276,113 22
For the quarter ended June 30, 1873	268,012 72
Total	1,072,998 19

The amount of letter-postage paid in money, was

For the quarter ended September 30, 1872	$81,861 94
For the quarter ended December 31, 1872	88,132 10
For the quarter ended March 31, 1873	95,658 47
For the quarter ended June 30, 1873	83,196 98
Total	348,849 49

The amount of stamps, stamped envelopes, and postal cards sold, was:

For the quarter ended September 30, 1872	$4,783,224 94
For the quarter ended December 31, 1872	5,004,483 06
For the quarter ended March 31, 1873	5,310,054 35
For the quarter ended June 30, 1873	5,227,055 15
Total	20,324,817 50

The number of quarterly returns of postmasters received and audited, on which the sum of $13,703,937.05 was found due the United States, was:

For the quarter ended September 30, 1872	31,012
For the quarter ended December 31, 1872	31,548
For the quarter ended March 31, 1873	31,818
For the quarter ended June 30, 1873	31,754
Total	126,132

MAIL TRANSPORTATION.

The amount charged to transportation accrued and placed to the credit of mail-contractors and others for mail transportation during the year, was:

For the regular service of mail-routes	$13,501,520 42
For the supply of special and mail-messenger offices	563,386 46
For the salaries of postal-railway clerks, route and other agents	1,830,894 38
For the salaries and per diem of the assistant superintendents of the postal-railway service	46,626 96
	15,942,428 22

Foreign mail transportation.

San Francisco and Hong-Kong, China	$500,000 00	
San Francisco and the Hawaiian Islands	75,000 00	
United States and Brazil	150,000 00	
New York, Queenstown, and Liverpool	120,703 96	
New York and England, France, Hamburg, and Bremen	94,483 25	
New York and Havana, and New York and Vera Cruz	47,557 74	
New York and the West Indies	11,248 10	
New York, Panama, and San Francisco	21,610 95	
New York and Rio de Janeiro	482 72	
Portland, Detroit, Chicago, and England	6,065 12	
Boston and England	4,977 38	
Boston, Nova Scotia, and Prince Edward Island	970 88	
Baltimore and Havana, and New Orleans and Havana	4,101 58	
New York and Stettin	12 07	
Baltimore and Bremen	51 27	
Portland and Nova Scotia	1,678 20	
New Orleans, Bremen, France, and Spain	451 70	
New Orleans, New York, and Havana, and Philadelphia and Havana	1,934 52	
New Orleans and Belize	1 89	
San Francisco, Japan, and China	3,502 87	
San Francisco, New Zealand, and Australia	5,869 85	
Expenses of Government mail-agent at Aspinwall	889 99	
Expenses of Government mail-agent at Havana	800 00	
Expenses of Government mail-agent at Panama	1,659 85	
		$1,054,053 89
		16,996,482 11
The amount credited to transportation accrued and charged to contractors for over-credits was	11,601 24	
Fines imposed on contractors	2,297 05	
Deductions from their pay	65,643 75	
		79,542 04
Net amount to the credit of mail-contractors and others		16,916,940 07
The amount actually paid and credited during the year, was		$16,833,682 58

Statement of collecting division showing balances collected from late postmasters.

During the year this division has had charge of accounts of 24,517 late postmasters during the period from July 1, 1870, to June 30, 1873.

Amounts collected on balances due from late postmasters who went out of office prior to July 1, 1872.

Collected by draft	$77,770 16
Collected by suit	26,097 93
Credited on vouchers	42,653 93
Charged to suspense	1 32
Charged to bad debts	24,415 31
Total	170,938 65

Amount collected by draft from contractors		$10,007 49
Number of changes of postmasters reported by appointment office during the fiscal year, was 8,930; and the balances due the United States upon the accounts of said late postmasters amount to		424,506 47
Of which there has been collected by draft	$79,292 71	
Charged to suspense	195 16	
Charged to bad debts	40 57	
Credited on vouchers	2 73	
		79,531 17
Total remaining due		344,975 30
Of which there remains in suit	$4,558 19	
Of which there remains not in suit	340,417 11	
		344,975 30

Amounts due late postmasters in fiscal year 1873	$42,704 81
Amounts paid late postmasters on all accounts prior to July 1, 1873	27,067 11
Amounts due by late postmasters, for which suits were instituted during the fiscal year	55,714 56
Amount collected by suit during the fiscal year	51,435 34

The subjoined tables, numbered from 1 to 52, inclusive, exhibit in detail the transactions of the Department for the fiscal year.

I have the honor to be, very respectfully,

J. J. MARTIN, *Auditor.*

Hon. JNO. A. J. CRESWELL,
Postmaster-General.

No. 1.—*Statement exhibiting quarterly the receipts of the Post-Office Department, under their several heads, during the fiscal year ended June* 30, 1873.

Receipts.	Quarter ended September 30, 1872.	Quarter ended December 31, 1872.	Quarter ended March 31, 1873.	Quarter ended June 30, 1873.	Aggregate.
Letter-postage	$81,861 94	$88,132 10	$95,658 47	$83,196 98	$348,849 49
Newspapers and pamphlets	264,722 72	264,149 53	276,113 22	268,012 72	1,072,998 19
Fines	1,036 65	328 28	850 67	1,701 79	3,917 39
Emoluments	287,906 22	283,605 96	284,110 51	294,419 69	1,150,042 38
Postage-stamps, stamped envelopes, and postal cards	4,783,224 94	5,004,483 06	5,310,054 35	5,227,055 15	20,324,817 50
Dead letters	1,960 00	2,035 00	1,096 00	1,117 00	6,208 00
Revenue from money-order business	.....	.....	.....	68,584 00	68,584 00
Miscellaneous	5,422 23	4,451 72	4,850 37	6,600 30	21,324 62
Total	5,426,134 70	5,647,185 65	5,972,733 59	5,950,687 63	22,996,741 57

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 2.—*Statement exhibiting quarterly the expenditures of the Post-Office Department, under their several heads, for the fiscal year ended June* 30, 1873.

Expenditures.	Quarter ended September 30, 1872.	Quarter ended December 31, 1872.	Quarter ended March 31, 1873.	Quarter ended June 30, 1873.	Aggregate.
Compensation to postmasters	$1,436,300 32	$1,425,081 66	$1,440,526 55	$1,423,559 59	$5,725,468 12
Ship, steamboat, and way letters	1,309 25	1,112 62	801 31	1,034 78	4,257 96
Transportation of the mails	3,932,695 00	4,097,944 19	4,241,513 12	4,561,530 27	16,833,682 58
Wrapping-paper	4,600 00	5,199 00	2,150 00	11,545 49	23,494 49
Office-furniture	2,423 35	1,471 15	1,006 15	1,467 92	6,368 57
Advertising	18,462 59	50,752 17	8,114 16	4,083 68	81,412 60
Mail bags and catchers	39,495 84	46,311 19	55,375 85	29,044 32	170,227 20
Blank agents and assistants	2,500 00	2,500 00	2,500 00	.....	7,500 00
Mail locks, keys, and stamps	2,729 13	3,496 22	4,731 71	27,420 24	38,377 30
Mail depredations and special agents.	41,645 01	38,721 29	38,457 16	39,139 80	157,963 26
Clerks for offices	721,095 62	735,881 46	738,782 26	782,854 90	2,978,614 24
Postage-stamps, stamped envelopes, and postal cards.	142,227 40	176,590 56	178,660 84	156,442 96	653,921 76
Compensation to letter-carriers	354,872 75	360,078 61	353,563 93	354,475 40	1,422,990 69
Miscellaneous	139,994 51	164,867 01	162,012 61	203,016 57	669,890 70
MISCELLANEOUS ACCOUNTS.					
British mails	.....	34,518 22	10,438 96	.....	44,957 18
North German Union mails	107,461 22	60,876 24	31,870 67	38,661 16	238,869 29
Belgian mails	4,386 95	2,254 85	2,228 55	2,662 78	11,533 13
Danish mails	.....	.....	2,388 98	1,292 47	3,681 45
Repairs of Post-Office building	11,735 15	.....	.....	.....	11,735 15
Total	6,963,934 09	7,207,656 44	7,275,122 81	7,638,232 33	29,084,945 67

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 3.—*Statement of the postal receipts and expenditures of*

States and Territories.	Letter postage.	Newspaper-postage.	Waste paper and twine.	Stamps sold.	Emoluments.	Total receipts.
Maine	$4,534 52	$25,687 34	$118 82	$335,005 69	$20,354 62	$385,700 99
New Hampshire	1,758 60	16,971 31	135 19	210,457 24	9,908 55	239,230 89
Vermont	1,544 58	15,815 26	68 89	199,687 41	7,461 16	224,577 30
Massachusetts	21,590 83	56,916 44	601 11	1,612,131 91	91,416 72	1,782,657 01
Rhode Island	2,119 20	7,188 68	51 78	177,179 40	17,341 71	203,880 77
Connecticut	4,450 62	25,503 15	201 54	476,033 34	32,632 98	538,821 63
New York	119,410 76	145,089 66	1,589 48	4,395,807 86	173,757 03	4,835,654 79
New Jersey	7,563 80	23,313 95	143 75	426,446 32	23,868 32	481,336 14
Pennsylvania	27,938 40	90,698 35	933 94	2,099,042 56	77,039 52	2,295,652 73
Delaware	505 60	2,987 44	4 80	58,809 75	838 19	63,145 78
Maryland	8,544 62	16,208 45	97 36	400,363 49	8,432 54	433,646 46
Virginia	2,237 56	20,376 80	68 03	319,141 17	11,403 37	353,226 93
West Virginia	714 86	8,691 29	53 12	106,404 16	4,213 81	120,077 24
North Carolina	891 99	11,910 65	10 13	147,577 51	5,900 44	166,290 72
South Carolina	1,207 62	8,429 35	23 79	125,731 89	8,340 07	143,732 72
Georgia	2,294 91	16,959 30	108 73	263,474 08	23,229 45	306,065 95
Florida	1,581 01	2,350 96	1 85	43,579 56	3,541 87	51,055 25
Ohio	14,268 77	83,694 35	768 29	1,359,288 80	68,508 62	1,526,528 83
Michigan	21,856 23	49,665 49	328 80	671,552 19	50,060 05	793,462 76
Indiana	3,230 55	47,412 17	208 90	562,637 56	41,606 99	655,096 25
Illinois	24,568 77	83,272 89	1,760 78	1,625,741 90	91,133 40	1,826,477 74
Wisconsin	8,891 10	34,225 25	223 23	466,378 32	33,838 15	543,556 05
Iowa	5,705 20	40,794 06	148 43	541,196 61	48,606 46	636,450 76
Missouri	7,729 33	44,649 63	230 49	726,126 01	34,271 20	813,006 66
Kentucky	2,692 75	21,224 40	147 81	326,634 56	14,748 46	365,447 98
Tennessee	2,003 01	16,910 54	167 06	274,137 07	10,033 14	303,250 82
Alabama	1,301 66	10,296 19	46 34	157,454 82	14,986 85	184,085 86
Mississippi	852 39	10,074 91	27 68	137,346 81	11,922 06	160,223 85
Arkansas	675 66	6,029 22	5 91	77,545 77	6,796 37	91,052 93
Louisiana	9,092 48	8,572 63	20 15	196,288 52	21,384 18	235,357 96
Texas	4,681 89	19,679 51	46 71	249,287 11	26,110 02	299,805 24
California	13,044 47	30,082 88	150 90	494,489 43	43,426 36	581,194 04
Oregon	306 64	5,385 35	15 00	49,014 62	7,100 82	61,822 43
Minnesota	8,610 14	19,017 49	152 37	230,953 85	21,737 73	280,471 58
Kansas	1,616 97	16,337 46	24 78	243,983 83	24,857 82	286,820 86
Nebraska	1,311 58	6,804 01	17 32	151,438 13	9,756 13	169,327 17
Nevada	453 60	5,167 36	1 00	42,706 62	7,840 01	56,168 59
Colorado	517 69	3,908 36	12 00	62,838 18	14,584 78	81,861 01
Utah	547 53	4,205 90	29 20	41,986 50	5,483 57	52,252 70
New Mexico	27 99	474 75	4 25	11,629 68	1,012 75	13,149 42
Washington	152 23	1,931 89	4 25	15,217 26	1,754 27	19,059 90
Dakota	293 04	884 17	.....	12,322 69	814 12	14,314 02
Arizona	41 41	279 19	.....	7,389 78	543 75	8,256 13
Idaho	76 46	934 20	1 50	7,868 22	1,560 00	10,440 38
Wyoming	134 59	925 04	1 25	17,015 99	1,942 98	20,019 85
Montana	141 97	1,858 96	25	17,738 49	5,314 26	25,053 93
Alaska	10 89	8 98	.....	36 00	.....	55 87
District of Columbia	3,079 08	4,096 65	193 88	128,384 89	7,076 33	142,830 83
	346,807 05	1,073,902 26	8,950 92	20,303,503 51	1,148,491 98	22,881,655 72
Deduct miscellaneous items	... .	904 07	.....	.....	.....	.....
Add miscellaneous items	2,042 44	.....	.....	21,313 99	1,550 40	24,002 76
Total	348,849 49	1,072,998 19	8,950 92	20,324,817 50	1,150,042 38	22,905,658 48

NOTE.—The following items of expenditure and revenue, being of a general nature, are not embraced

Amount paid for foreign mails and expenses of government agents	$1,054,053 89
Foreign postage collected and returned to foreign governments	299,041 05
Ship, steamboat, and way letters	4,257 96
Wrapping-paper	23,494 49
Office-furniture	2,352 61
Advertising	74,579 10
Mail-bags	92,778 36
Blank-agents and assistants	7,500 00
Mail locks, keys, and stamps	38,377 30
Mail depredations and special agents	157,963 26
Expenses of postage-stamps and stamped envelopes	653,921 76
Salaries and per diem of assistant superintendents of postal-railway service	46,626 96
Miscellaneous payments	171,099 38
Repairs to Post-Office building	11,735 15
Excess of expenditures brought down	3,704,305 45
	6,342,086 72

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

the United States for the fiscal year ended June 30, 1873.

Compensation of postmasters.	Incidental expenses of post-offices.	Compensation to letter-carriers.	Compensation of route-agents, postal-railway clerks, mail-messengers, and supply of special offices.	Transportation by States.	Total expenses.	Excess of expenditures over receipts.	Excess of receipts over expenditures.
$146,695 78	$47,638 56	$8,299 80	$33,177 12	$168,164 54	$403,975 80	$18,274 81	.....
101,331 42	15,323 10	5,468 24	16,817 89	70,306 41	209,247 06	.....	$29,983 83
105,939 99	13,910 41	.....	16,149 79	119,532 07	255,532 26	30,954 96	.....
333,586 78	285,666 02	112,752 26	131,536 25	277,255 43	1,140,796 74	.....	641,860 27
36,731 13	19,230 75	12,344 59	6,469 11	24,512 15	99,287 73	.....	104,593 04
155,878 00	62,336 92	17,742 15	38,643 80	141,577 79	416,178 66	.....	122,642 97
666,144 33	1,014,318 70	466,458 29	361,810 15	934,396 73	3,443,128 20	.....	1,392,526 59
157,884 89	35,924 58	30,122 83	23,600 34	131,745 44	379,278 08	.....	2,058 06
492,961 55	313,230 27	230,378 46	165,715 65	694,918 26	1,897,202 19	.....	398,448 54
19,823 66	6,301 23	8,278 57	7,189 45	23,853 24	65,446 15	2,300 37	.....
70,074 21	82,091 18	58,403 95	36,885 43	289,049 75	536,504 52	102,858 06	.....
117,938 16	47,731 29	10,186 69	34,782 81	361,306 79	571,945 74	218,718 81	.....
48,999 75	18,085 56	.....	18,419 61	94,649 23	180,154 15	60,076 91	.....
66,901 78	13,927 90	.....	33,414 85	169,694 72	283,939 25	117,648 53	.....
44,859 61	11,555 02	.....	15,808 53	151,508 30	223,731 46	79,998 74	.....
88,101 98	43,417 74	.....	44,274 23	214,514 92	390,308 87	84,242 90	.....
22,410 93	5,297 15	.....	6,841 46	182,565 31	217,114 85	166,059 60	.....
397,922 35	177,751 29	94,083 91	151,570 81	929,949 58	1,751,277 94	224,749 11	.....
249,868 39	95,472 49	22,904 25	57,941 17	479,280 11	905,466 41	112,003 65	.....
233,300 36	92,896 78	15,708 97	87,458 01	371,236 96	800,601 08	145,504 83	.....
443,779 54	343,268 24	108,939 28	305,924 42	825,448 85	2,027,360 33	200,882 59	.....
194,505 86	50,139 72	21,257 75	59,466 36	295,745 12	621,114 81	77,758 76	.....
256,013 26	55,542 90	41 00	121,934 63	432,943 56	866,475 35	230,024 59	.....
194,031 91	119,218 47	64,302 26	130,410 36	569,802 22	1,077,765 22	264,758 56	.....
110,830 73	49,078 99	25,561 99	41,567 57	267,461 22	494,500 50	129,052 52	.....
86,264 89	50,168 79	17,200 43	67,663 87	218,383 65	439,681 63	136,430 81	.....
61,383 69	25,874 86	.....	31,104 03	239,361 88	357,724 46	173,738 60	.....
74,879 21	12,402 50	.....	22,327 83	206,202 29	315,811 83	155,587 98	.....
42,306 31	12,133 51	.....	8,249 58	300,713 54	363,402 94	272,350 01	.....
33,552 05	55,468 76	34,910 94	15,651 87	241,257 55	380,841 17	145,483 21	.....
102,155 00	39,227 53	.....	20,439 02	616,808 79	778,630 34	478,825 10	.....
110,490 61	91,551 90	25,095 94	53,100 92	888,467 95	1,168,707 32	587,513 28	.....
25,406 82	9,593 12	.....	2,346 70	90,876 15	128,222 79	66,400 36	.....
102,217 30	31,490 41	.....	46,771 88	225,994 67	406,474 26	126,002 68	.....
131,527 60	26,711 81	.....	44,886 42	333,162 72	536,288 55	249,467 69	.....
41,121 07	16,133 31	.....	69,799 26	351,599 32	478,652 96	309,325 79	.....
22,392 99	10,637 47	.....	2,638 51	165,547 06	201,216 03	145,047 44	.....
27,559 40	12,389 83	.....	6,208 41	177,293 96	223,451 60	141,590 59	.....
18,098 02	9,054 85	.....	916 24	370,772 24	398,841 35	346,588 65	.....
8,752 10	411 15	.....	7 67	316,919 72	326,090 64	312,941 22	.....
9,195 93	954 50	.....	686 12	170,965 71	181,802 26	162,742 36	.....
6,972 11	1,134 50	.....	290 00	26,378 82	34,775 43	20,461 41	.....
4,343 94	205 00	.....	.....	74,143 26	78,694 20	70,438 07	.....
6,679 02	1,029 25	.....	94 00	103,190 71	110,992 98	100,552 60	.....
10,860 76	2,687 26	.....	.....	11,225 10	24,773 12	4,753 27	.....
14,061 74	4,868 50	.....	.....	122,872 00	141,802 24	116,748 31	.....
262 25	.....	.....	.....	.....	262 25	206 38	.....
6,977 61	115,545 54	29,332 58	53,288 71	.....	205,144 44	62,313 61	.....
5,703,978 77	3,549,029 61	1,419,775 13	2,394,280 84	13,473,555 79	26,540,620 14	6,452,277 72	2,692,113 30
.....	.....	.....	.....	.....	.....	.....	.....
21,489 35	16,674 25	3,215 56	.....	27,964 63	69,343 79	69,343 79	24,002 76
5,725,468 12	3,565,703 86	1,422,990 69	2,394,280 84	13,501,520 42	26,609,963 93	6,521,621 51	2,716,116 06

in the above statement, viz:

Receipts on account of dead-letters	$6,208 00
Receipts on account of fines	3,917 39
Receipts on account of miscellaneous	12,373 70
Receipts on account of money-order business	68,584 00
Excess of transportation accrued	162,799 53
Total excess of expenditures over receipts	6,088,204 10
	6,342,086 72

J. J. MARTIN, *Auditor.*

No. 4.—*Table exhibiting the receipts and expenditures of the Post-Office Department from July 1, 1836, to June 30, 1873.*

Year.	Receipts.			Expenditures.
	Revenue.	Treasury grants.	Total.	
1837	$4,945,668 21	.....	$4,945,668 21	$3,288,319 03
1838	4,238,733 46	.....	4,238,733 46	4,430,662 21
1839	4,484,656 70	.....	4,484,656 70	4,636,536 31
1840	4,543,521 92	.....	4,543,521 92	4,718,235 64
1841	4,407,726 27	$482,657 00	4,890,383 27	4,499,527 61
1842	4,546,849 65	.....	4,546,849 65	5,674,751 80
1843	4,296,225 43	.....	4,296,225 '43	4,374,753 71
1844	4,237,287 83	.....	4,237,287 83	4,296,512 70
1845	4,289,841 80	.....	4,289,841 80	4,320,731 99
1846	3,487,199 35	750,000 00	4,237,199 35	4,076,036 91
1847	3,880,309 23	12,500 00	3,892,809 23	3,979.542 10
1848	4,555,211 10	125,000 00	4,680,211 10	4,326,850 27
1849	4,705,176 28	.....	4,705,176 28	4,479,049 13
1850	5,499,984 86	.....	5,499,984 86	5,212,953 43
1851	6,410,604 33	.....	6,410,604 33	6,278,401 68
1852	5,184,526 84	1,741,444 44	6,925,971 28	7,108,459 04
1853	5,240,724 70	2,255,000 00	7,495,724 70	7,982,756 59
1854	6,255,586 22	2,736,748 96	8,992,335 18	8,577,424 12
1855	6,642,136 13	3,114,542 26	9,756,678 39	9,968,342 29
1856	6,920,821 66	3,748,881 56	10,669,703 22	10,405,286 36
1857	7,353,951 76	4,528,004 67	11,881,956 43	11,508.057 93
1858	7,486,792 86	4,679,270 71	12,166,063 57	12,722,470 01
1859	7,968,484 07	3,915,946 49	11,884,430 56	11,458,083 63
1860	8,518,067 40	11,154,167 54	19,672,234 94	19,170,609 99
1861	8,349,296 40	4,639,806 53	12,989,102 93	13,606,759 11
1862	8,299,820 90	2,598,953 71	10,898,774 61	11,125,364 13
1863	11,163,789 59	1,007,848 72	12,171,638 31	11,314,206 84
1864	12,438,253 78	749,980 00	13,188,233 78	12,644,786 20
1865	14,556,158 70	3,968 46	14,560,127 16	13,694,728 28
1866	14,386,986 21	.....	14,386,986 21	15,352,079 30
1867	15,237,026 87	3,991,666 67	19,228,693 54	19,235,483 46
1868	16,292,600 80	5,696,525 00	21,989,125 80	22,730,592 65
1869	18,344,510 72	5,707,115 30	24,051,626 02	23,698,131 50
1870	19,772,220 65	4,022,140 85	23,794,361 50	23,998,837 63
1871	20,037,045 42	4,126,200 00	24,163,245 42	24,390,104 08
1872	21,915,426 37	4,993,750 00	26,909,176 37	26,658,192 31
1873	22,996,741 57	5,990,475 00	28,987,216 57	29,084,945 67
Total	333,889,966 04	82,772,593 87	416,662,559 91	415,028,565 64

J. J. MARTIN,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 5.—*Statement in detail of miscellaneous payments made by the Post-Office Department for the fiscal year ended June* 30, 1873, *exhibiting the sums placed to the credit of postmasters and others, and charged to miscellaneous account.*

Date.	To whom allowed.	For what object.	Amount.
1872.			
Nov. 6	G. F. Seward	United States consul-general, Shanghai, China, for messenger, labor, rent, and miscellaneous items from July 1 to December 31, 1871.	$510 89
6	C. O. Shepard	United States consul and postal agent, Kanagawa, Japan, for rent of office and miscellaneous items in the 1st and 2d quarters, 1872.	780 02
6	W. P. Mangum	United States consul and postal agent, Nagasaki, Japan, for printing and other miscellaneous items to June 30, 1872.	15 75
Dec. 4	A. C. Fouts	Late postmaster, Belknap, Iowa, for expenses incurred in taking charge of the post-office at Brown's Mills, Iowa.	4 00
18	P. Pursell	Late postmaster, Wilkesbarre, Pa., for light, fuel, and rent in the 3d and 4th quarters, 1868, and 1st quarter, 1869.	169 25
24	W. F. Prosser	Postmaster, Nashville, Tenn., for stationery in the 3d quarter, 1872.	63 00

No. 5.—*Statement of miscellaneous payments made by the Department, &c.*—Continued.

Date.	To whom allowed.	For what object.	Amount.
1872.			
Dec. 27	T. B. Rickey	Postmaster, Salem, Oreg., for fuel and rent in the 3d quarter, 1872.	$112 50
1873.			
Jan. 3	W. K. Hall	Postmaster, Columbus, Ky., for amount paid for telegraphing in reference to registered matter on November 29 and December 23, 1872.	1 70
8	Ellen Sanderson	Postmaster, Springfield, Ohio, for rent of office in the 3d quarter, 1872.	50 00
16	C. O. Shepard	United States consul and postal agent, Kanagawa, Japan, for messenger hire, rent of office, and miscellaneous items in the 3d quarter, 1872.	294 23
23	D. W. Magee	Postmaster, Peoria, Ill., for rent of office for the month of January, 1872.	83 33
27	H. A. Bruner	Postmaster, Albion, N. Y., for advertising arrival and departure of mails in the 3d quarter, 1872.	8 00
27	H. A. Jarvis	Postmaster, Cortland Village, N. Y., for advertising arrival and departure of mails in the 3d quarter, 1872.	6 00
Mar. 3	E. Frank	Postmaster, Emporia, Kans., for rent of office in the 4th quarter, 1872.	125 00
5	James Low, jr	Postmaster, Suspension Bridge, N. Y., for miscellaneous items in the 4th quarter, 1872.	7 50
7	C. O. Shepard	United States consul and postal agent, Kanagawa, Japan, for messenger hire, rent, and miscellaneous items in the 4th quarter, 1872.	453 79
10	W. T. Clark	Postmaster, Galveston, Tex., for miscellaneous items in the 4th quarter, 1872.	154 20
11	E. J. Castello	Postmaster, Natchez, Miss., for light, fuel, and miscellaneous items in the 3d and 4th quarters, 1869, and the 1st and 2d quarters, 1870.	16 20
6	W. Wallace	Postmaster, Battle Creek, Mich., for light, fuel, and miscellaneous items in the 4th quarter, 1872.	44 57
15	J. B. Stover	Postmaster, Akron, Ohio, for rent in the 4th quarter, 1872.	50 00
20	C. E. Carr	Postmaster, Galesburgh, Ill., for light, fuel, and miscellaneous items in 3d and 4th quarters, 1872.	107 57
20	G. Hugunin	Postmaster, Oswego, N. Y., for printing in the 3d and miscellaneous items in the 4th quarter, 1872.	138 30
21	J. Rathbun	Postmaster, Elkton, Ky., for expenses incurred in taking charge of and closing the post-office at Pilot Knob, Ky.	4 00
28	J. H. Shimmons	Postmaster, Lawrence, Kans., for light and rent in the 3d and 4th quarters, 1872.	237 73
28	David Brown	Postmaster, Nebraska City, Nebr., for fuel, rent, and miscellaneous items in the 3d and 4th quarters, 1872.	72 15
31	L. M. Haverstick	Postmaster, Rock Island, Ill., for rent in the 4th quarter, 1872.	99 92
31	G. E. Goodrich	Postmaster, Fitchburgh, Mass., for rent in the 4th quarter, 1872.	87 82
31	J. C. Douglass	Postmaster, Zanesville, Ohio, for rent in the 3d and 4th quarters, 1872.	138 46
May 16	R. Peysert	Postmaster, Bethlehem, Pa., for light, fuel, rent, and miscellaneous items in the 3d and 4th quarters, 1872, and 1st quarter, 1873.	161 59
19	C. J. Rogers	Postmaster, Raleigh, N. C., for light, fuel, and miscellaneous items in the 4th quarter, 1872, and 1st quarter, 1873.	72 15
23	S. P. Barber	Postmaster, Danville, Ky., for light, fuel, and rent in the first quarter, 1873.	60 00
28	S. P. Gambia	Postmaster, San Antonio, Tex., for advertising arrival and departure of mails in the 1st quarter, 1873.	15 00
June 6	S. O. Dunbar	Late postmaster, Taunton, Mass., for light and fuel in the 1st quarter, 1873.	29 50
10	J. B. Howe	Postmaster, Oil City, Pa., for miscellaneous items in the 1st quarter, 1873.	29 50
11	G. F. Seward	United States consul-general and postal agent, Shanghai, China, for messenger hire, rent of office, and miscellaneous items from January 1 to June 30, 1872.	460 23
23	D. Wells	Postmaster, Paterson, N. J., for light in the 4th quarter, 1872, and 1st quarter, 1873.	33 60
July 1	Rebecca Frailey	Postmaster, Fort Madison, Iowa, for rent in the 1st quarter, 1873.	16 66
7	J. H. Shimmons	Postmaster, Lawrence, Kans., for light and rent in the 1st quarter, 1873.	131 00
10	J. G. Tracy	Postmaster, Houston, Tex., for light, fuel, and miscellaneous items in the 4th quarter, 1872, and 1st quarter, 1873.	159 45

No. 5.—*Statement of miscellaneous payments made by the Department, &c.*—Continued.

Date.	To whom allowed.	For what object.	Amount.
1873.			
July 17	C. D. McDougall	Late postmaster, Auburn, N. Y., for light in the 4th quarter, 1872, and 1st quarter, 1873.	$64 56
17	G. E. Paine	Late postmaster, Painesville, Ohio, for miscellaneous items in the 3d and 4th quarters, 1872.	9 50
25	S. N. Sherman	Late postmaster, Ogdensburgh, N. Y., for stationery in the 1st quarter, 1873.	11 97
Aug. 2	H. Chickering	Postmaster, Pittsfield, Mass., for stationery in the 4th quarter, 1872, and 1st and 2d quarters, 1873.	63 25
6	C. R. Tyler	Late postmaster, Green Bay, Wis., for miscellaneous items in the 3d quarter, 1872.	6 50
13	C. H. Prince	Postmaster, Augusta, Ga., for light, fuel, rent, and miscellaneous items in the 3d and 4th quarters, 1872, and 1st and 2d quarters, 1873.	317 20
16	W. P. Mangum	Late United States vice-consul-general, Shanghai, China, for messenger hire, advertising and printing, rent of office, fuel, light, stationery, and miscellaneous items from August 1, 1867, to March 15, 1868.	1,451 04
27	Ellen H. Hager	Postmaster, Lancaster, Pa., for light, rent, and miscellaneous items in the 1st and 2d quarters, 1873.	219 42
Sept. 3	R. W. Clarke	Postmaster, Brattleborough, Vt., for fuel in 4th quarter, 1872, and 1st and 2d quarters, 1873, and for light in the 2d quarter, 1873.	46 00
8	.....do	Postmaster, Brattleborough, Vt., for light and rent in the 3d and 4th quarters, 1872, and 1st and 2d quarters, 1873, and for fuel and stationery in the 3d quarter, 1872.	79 43
12	J. W. Hoysradt	Late postmaster, Hudson, N. Y., for light and fuel in the 3d and 4th quarters, 1872, and 2d quarter, 1873.	59 21
17	H. H. Hamlin	Postmaster, Augusta, Me., for light in the 2d quarter, 1873.	24 98
30	W. A. Whitney	Late postmaster, Adrian, Mich., for light and fuel from April 1 to May 19, 1873.	4 00
30	C. O. Shepard	United States consul and postal agent, Kanagawa, Japan, for messenger hire, rent of office, and miscellaneous items in the 1st quarter, 1873.	370 85
30	.....do	United States consul and postal agent, Kanagawa, Japan, for messenger hire, rent of office, and miscellaneous items in the 2d quarter, 1873.	362 41
		Total	8,094 88

Amounts paid by the Department on warrants, and charged to miscellaneous account.

1872.			
Oct. 7	George H. Reay	New York, N. Y., for dead-letter envelopes furnished the Department during the 3d quarter, 1872.	$396 00
7	James White	Attorney of George F. Nesbitt, New York, N. Y., for official envelopes furnished the Department during the 3d quarter, 1872.	7,099 14
8	William D. Dounton	Nicetown, Philadelphia, Pa., for 5,000 pounds hemp-twine furnished the Department, October 1, 1872.	824 00
8	National Bank-Note Company.	New York, N. Y., for printing, numbering, paper, and binding 2,500 impressions of warrants during the 3d quarter, 1872.	304 38
15	G. D. Chenoweth	Washington, D. C., for advances disbursed in payment of salaries of clerks and others in the topographical division Post-Office Department, for the half month ended October 15, 1872.	535 00
16	Morgan Envelope Company.	Springfield, Mass., for registered package envelopes furnished the Department in the 3d quarter, 1872.	8,652 00
21	D. McClelland	Washington, D. C., for engraving copper plates and printing from copper sheets of post-route maps.	2,148 04
26	O. Humason	Attorney at law, The Dalles, Oreg., for services in one post-office case.	500 00
29	G. D. Chenoweth	Washington, D. C., for this amount to re-imburse him for amount advanced to pay for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer, for the month of October, 1872.	724 94
29	Austin Drake	Clerk United States circuit court, Saint Louis, Mo., for fee in one post-office case.	4 15
Nov. 15	G. D. Chenoweth	Washington, D. C., for advances to pay salaries of assistants to the topographer, for the half month ended November 15, 1872.	535 00

Amounts paid by the Department on warrants, &c.—Continued.

Date.	To whom allowed.	For what object.	Amount.
1872.			
Nov. 22	Wells & Wilbur	Boston, Mass., for 10,000 pounds cotton twine furnished the Department during the 4th quarter, 1872.	$2,986 00
23	W. D. Dounton	Philadelphia, Pa., for 5,000 pounds hemp twine furnished the Department in the 4th quarter, 1872.	824 00
23	J. P. Southworth	United States attorney, Mobile, Ala., for fee in one post-office case.	10 00
26	G. D. Chenoweth	Washington, D. C., for advances to pay salaries of assistants to the topographer for November, 1872.	662 68
Dec. 4	R. B. Lines	Washington, D. C., for expenses incurred in traveling from Washington to New York and return, by order Postmaster-General.	54 00
9	Morrison & Farmer	Monroe, La., for fee as attorney in two post-office cases.	200 00
9	R. W. Wishard and J. W. Toomer.	Dardanelle, Ark., for fee as attorneys in two post-office cases.	200 00
9	W. D. Frazee	Okolona, Miss., for fee as attorney in one post-office case.	35 00
11	G. D. Chenoweth	Washington, D. C., for advances to pay salaries of assistants to the topographer for the half month ended December 15, 1872.	535 00
19	....do	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including salaries of assistants to the topographer for December, 1872.	1,383 05
23	R. W. Hughes	United States attorney, western district of Virginia, for fees in three post-office cases.	60 00
27	W. D. Dounton	Philadelphia, Pa., for 5,000 pounds hemp twine furnished the Department during the 4th quarter, 1872.	824 00
27	Fairbanks & Co	New York, N. Y., for 100 letter-balances furnished the Department in 4th quarter, 1872	385 00
27	C. A. Newcomb	United States marshal, St. Louis, Mo., for fee in one post-office case.	16 08
27	A. S. Krekel	Clerk United States district court, Jefferson City, Mo., for fee in one post-office case.	14 30
1873.			
Jan. 2	J. S. Botsford	United States attorney, Mo., for fee in one post-office case.	20 00
3	H. Bisbee, jr	United States district attorney, Jacksonville, Fla., for fees in four post-office cases.	80 00
4	National Bank-Note Company.	New York, N. Y., for printing, numbering, and binding blanks for drafts.	570 00
11	G. D. Chenoweth	Washington, D. C., for salaries of assistants to the topographer for the half month ended January 15, 1873.	597 01
16	E. P. Jacobson	United States district attorney, Jackson, Miss., for fees in sundry post-office cases.	85 00
16	S. Conant	United States marshal, Jacksonville, Fla., for fees in six post-office cases.	121 13
16	E. W. Wells	Clerk United States district court, Arizona, for fee in one case.	8 65
16	J. H. Pierce	United States marshal, Oxford, Miss., for fees in sundry post-office cases.	328 53
21	G. F. Nesbitt	New York, N. Y., for official envelopes furnished the Department in the 4th quarter, 1872.	6,720 87
21	G. H. Reay	New York, N. Y., for dead-letter envelopes furnished the Department during the 4th quarter, 1872.	492 80
21	W. D. Dounton	Philadelphia, Pa., for 5,000 pounds hemp twine furnished the Department during January, 1873.	824 00
21	Thomas F. Purnell	United States marshal, Tyler, Tex., for fees in sundry post-office cases.	184 06
29	S. B. Sawyer	Clerk United States circuit court, San Francisco, Cal., for fees in sundry post-office cases.	16 50
29	L. D. Latimer	United States district attorney, San Francisco, Cal., for fees in three post-office cases.	50 00
29	Theodore Muffly	Clerk United States district court, Montana, for fee in one post-office case.	1 70
28	G. D. Chenoweth	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer for the month of January, 1873.	871 63
31	Morrison & Farmer	Monroe, La., for services as attorneys in one post-office case.	150 00
Feb. 4	Wells & Wilbur	Boston, Mass., for 10,000 pounds cotton twine furnished the Department in January, 1873.	2,986 00
13	C. A. Newcomb	United States marshal, Saint Louis, Mo., for fees in three post-office cases.	49 50
13	G. D. Chenoweth	Washington, D. C., for salaries of assistants to the topographer for the half month ended February 15, 1873.	572 00

Amounts paid by the Department on warrants, &c.—Continued.

Date.	To whom allowed.	For what object.	Amount.
1873.			
Feb. 25	G. D. Chenoweth	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer for February, 1873.	$1,045 61
25	Wells & Wilbur	Boston, Mass., 5,088 pounds cotton twine furnished the Department during the 1st quarter, 1873.	1,519 42
Mar. 10	D. H. Starbuck	United States district attorney, North Carolina, for fees in two post-office cases.	40 00
11	W. D. Dounton	Philadelphia, Pa., for 5,000 pounds hemp twine furnished the Department in the 1st quarter, 1873.	824 00
12	G. D. Chenoweth	Washington, D. C., for salaries of assistants to the topographer for the half month ended March 15, 1873.	560 00
17	D. McClelland	Washington, D. C., for engraving plates for post-route maps.	2,788 32
26	G. D. Chenoweth	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer for March, 1873.	959 67
27	William Patrick	United States district attorney, Saint Louis, Mo., for fees in two post-office cases.	20 00
April 10	W. D. Dounton	Philadelphia, Pa., for 5,000 pounds hemp twine furnished the Department in April, 1873.	724 00
11	G. H. Reay	New York, N. Y., for dead-letter envelopes furnished the Department in the 1st quarter, 1873.	454 96
12	G. D. Chenoweth	Washington, D. C., for salaries of the assistants to the topographer for the half month ended April 15, 1873.	560 00
15	James White	Attorney for George F. Nesbitt, New York, N. Y., for official envelopes furnished the Department during the 1st quarter, 1873.	10,371 25
24	Fairbanks & Co	New York, N. Y., for 600 letter-balances furnished the Department in April, 1873.	1,080 00
26	G. D. Chenoweth	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer for the month of April, 1873.	776 47
May 3	W. D. Dounton	Philadelphia, Pa., for 5,000 pounds hemp twine furnished the Department in the 2d quarter, 1873.	724 00
13	G. D. Chenoweth	Washington, D. C., for salaries of assistants to the topographer for the half month ended May 15, 1873.	560 00
17	G. T. Swann	Clerk United States circuit court, Jackson, Miss., for fees in sundry post-office cases.	22 40
22	National Bank-Note Company.	New York, N. Y., for paper, printing, numbering, and binding warrants.	160 00
27	G. D. Chenoweth	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including salaries of assistants to the topographer for the month of May, 1873.	889 31
28	William Billings	Deputy United States marshal, Washington Territory, for fee in one case.	61 62
31	W. D. Dounton	Philadelphia, Pa., for 5,000 pounds of hemp twine furnished the Department in May, 1873.	724 00
June 12	G. D. Chenoweth	Washington, D. C., for salaries of assistants to the topographer for the half month ended June 15, 1873.	572 00
13	A. S. Gray	United States marshal, Harrisonburgh, Va., for fee in one case.	16 18
16	L. O. Sterns	Attorney at law, Baker City, Oreg., for fee in sundry post-offices cases.	550 00
16	John A. Moore	Attorney at law, North Carolina, for fee in one post-office case.	231 00
16	J. D. Haines	Attorney at law, Baker City, Oreg., for fee in one post-office case.	100 00
16	F. L. Withaup	Attorney at law, Richland, Mo., for fee in one post-office case.	25 00
25	G. D. Chenoweth	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer for the month of June, 1873.	672 64
30	National Bank Note Company.	New York, N. Y., for paper and printing 5,100 impressions and numbering and binding 5,000 impressions of drafts in 20 books.	587 50
July 2	George H. Reay	New York, N. Y., for dead-letter envelopes furnished the Department in the 2d quarter, 1873.	555 46
8	H. P. Farron	United States district attorney, Savannah, Ga., for fees in sundry post-office cases.	80 00
14	Gould, Pearce & Co	Cincinnati, Ohio, for 7,146 pounds cotton twine furnished the Department during the 2d quarter, 1873.	2,064 48

Amounts paid by the Department on warrants, &c.—Continued.

Date.	To whom allowed.	For what object.	Amount.
1873.			
July 14	G. D. Chenoweth	Washington, D. C., for salaries of assistants to the topographer for the half month ended July 15, 1873.	$650 00
14	John Pratt	United States marshal, Santa Fé, N. Mex., for fees in one post-office case.	35 11
14	A. H. Horton	United States attorney, Atchison, Kans., for fees in sundry post-office cases.	180 00
14	J. R. Beckwith	United States attorney, New Orleans, La., for fees in sundry post-office cases.	100 00
15	George F. Nesbitt	New York, N. Y., for official envelopes furnished the Department during the 2d quarter, 1873.	7,646 49
17	Morgan Envelope Company.	Springfield, Mass., for 606,000 registered package envelopes furnished the Department during the quarter ended June 30, 1873.	8,484 00
22	D. McClelland	Washington, D. C., for engraving copper-plate, and printing from copper sheets of post-route maps.	2,183 84
24	W. D. Dounton	Philadelphia, Pa., for 5,000 pounds of hemp twine furnished the Department.	724 00
25	J. T. Pope	Attorney at law, Hartville, Mo., for fees in one post-office case.	10 00
25	Charles P. Redmond	Attorney at law, Little Rock, Ark., for fees in two post-office cases.	400 00
28	G. D. Chenoweth	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including salaries of assistant draughtsmen to the topographer for July, 1873.	994 14
30	G. D. Chenoweth	Washington, D. C., for expenses incurred in the preparation and publication of post-route maps.	585 12
Aug. 1	Gould, Pearce & Co	Cincinnati, Ohio, for 10,000 pounds cotton twine furnished the Department during the 2d quarter, 1873.	2,889 00
1	Gould, Pearce & Co	Cincinnati, Ohio, for 12,854 pounds of cotton twine furnished the Department.	3,713 52
7	W. E. Parker	Late United States marshal, Galveston, Texas, for fees in sundry post-office cases.	414 27
8	F. M. Cowgill	Attorney at law, Cassville, Mo., for fees in one post-office case.	25 00
13	G. H. Reay	New York, N. Y., for official stamped envelopes furnished the Department during the 2d quarter, 1873.	13,611 26
13	W. D. Dounton	Philadelphia, Pa., for 5,000 pounds of hemp twine furnished the Department during the 3d quarter, 1873.	724 00
13	G. D. Chenoweth	Washington, D. C., for salaries of assistants to the topographer for the half month ended August 15, 1873.	650 00
28	G. D. Chenoweth	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistant draughtsmen to the topographer for August, 1873.	807 18
Sept. 1	Fletcher White	Attorney at law, Macon, Mo., for fees in one post-office case.	10 00
12	Gould, Pearce & Co	Cincinnati, Ohio, for 10,000 pounds of cotton twine furnished the Department.	2,889 00
15	G. D. Chenoweth	Washington, D. C., for salaries of assistants to the topographer for the half month ended September 15, 1873.	650 00
19	E. Y. Goldsborough	United States marshal, Baltimore, Md., for fees in one post-office case.	12 00
19	R. J. Palen	Clerk United States district court, Santa Fé, N. Mex., for fees in two post-office cases.	7 50
19	George T. Swann	Clerk United States circuit court, Jackson, Miss., for fees in sundry post-office cases.	4 15
22	W. D. Dounton	Philadelphia, Pa., for 5,000 pounds of hemp twine furnished the Department.	724 00
26	Fairbanks & Co	New York, N. Y., for letter-balances furnished the Department.	839 24
27	G. D. Chenoweth	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer for September, 1873.	699 70

Amounts paid by the Department on drafts and charged to miscellaneous account.

Date.	To whom allowed.	For what object.	Amount.
1872.			
Oct. 12	Warner M. Bateman.....	United States attorney, Cincinnati, Ohio, for fees in two post-office cases.	$25 00
26	N. J. Riddick	Clerk United States circuit court, Raleigh, N. C., for fee in one post-office case.	6 20
Nov. 21	A. S. Mitchell	Clerk United States district court, Elizabeth, N. J., for fee in one post-office case.	8 95
22	H. H. Wells	United States attorney, Richmond, Va., for fees in sundry post-office cases.	65 00
22	S. R. Harrington	United States attorney, Little Rock, Ark., for fees in two post-office cases.	20 00
Dec. 2	William Spence.....	United States marshal, Nashville, Tenn., for fees in two post-office cases.	30 70
1873.			
Jan. 2	Wells & Wilbur	Boston, Mass., for 10,000 pounds cotton twine furnished the Department.	2,986 00
2	H. H. Harrison.....	United States attorney, Nashville, Tenn., for fees in four post-office cases.	65 00
16	E. R. Campbell.....	Clerk United States courts, Nashville, Tenn., for fees in three post-office cases.	16 90
16	M. F. Pleasants	Clerk United States circuit court, Richmond, Va., for fees in sundry post-office cases.	75 04
22	Morgan Envelope Company.	Springfield, Mass., for registered package envelopes furnished the Department during the 4th quarter, 1872.	5,040 00
24	Isaac C. Mills	United States marshal, Little Rock, Ark., for fees in two post-office cases.	48 52
24	J. H. Pierce.....	United States marshal, Oxford, Miss., for fee in one post-office case.	35 63
31	W. A. E. Tisdale.....	Clerk United States district court, Fort Smith, Ark., for fee in one post-office case.	15 95
Feb. 4	Frank E. Wright	Clerk United States court, Little Rock, Ark., for fees in two post-office cases.	13 70
13	W. F. Sapp	United States district attorney, Council Bluffs, Iowa, for fees in sundry post-office cases.	105 00
13	G. R. Hill	Clerk United States district court, Oxford, Miss., for fees in sundry post-office cases.	49 11
13	G. W. Wells	United States district attorney, Holly Springs, Miss., for fees in three post-office cases.	45 00
20	J. A. Minnis	United States attorney, Middle Alabama, for fees in sundry post-office cases.	40 00
25	Gould, Pearce & Co	Cincinnati, Ohio, for 10,000 pounds cotton twine furnished the Department during the 1st quarter, 1873.	2,889 00
Mar. 10	Nelson Trusler.....	United States attorney, Indiana, for fees in two post-office cases.	25 00
17	J. E. Townsend.....	Clerk United States district court, Jacksonville, Fla., for fees in sundry post-office cases.	46 20
20	George Andrews.....	United States district attorney, Knoxville, Tenn., for fee in one case.	5 00
25	Bluford Wilson	United States district attorney, Springfield, Ill., for fees in sundry post-office cases.	150 00
27	Morgan Envelope Company.	Hartford, Conn., for registered package envelopes furnished the Department.	11,053 02
Apr. 1	Gould, Pearce & Co	Cincinnati, Ohio, for 10,000 pounds cotton twine furnished the Department during the 1st quarter, 1873.	2,889 00
7	Morgan Envelope Company.	Springfield, Mass., for registered package envelopes furnished the Department during the 1st quarter, 1873.	8,652 00
15	A. Murdock.....	Late United States marshal, Pittsburgh, Pa., for fees in two post-office cases.	49 33
22	H. H. Wells, jr	United States attorney, Richmond, Va., for fees in sundry post-office cases.	75 00
26	Z. E. Thomas.....	United States marshal, Huntsville, Ala., for fee in one post-office case.	9 40
May 9	J. P. Southworth	United States district attorney for Alabama, for fee in one case.	40 00
13	Gould, Pearce & Co	Cincinnati, Ohio, for 10,000 pounds cotton twine furnished the Department during the 2d quarter, 1873.	2,889 00
13	J. Riddick.....	Clerk United States circuit court, Raleigh, N. C., for fees in two post-office cases.	16 75
13	H. P. Farrow	United States district attorney, Atlanta, Ga., for fees in three post-office cases.	60 00
June 9	D. W. Houston	Late United States marshal, Leavenworth, Kans., for fees in sundry post-office cases.	369 20
16	A. J. Hess.....	Attorney at law, Columbus, Ky., for prosecuting case of United States *vs.* Robert Shevels, postal clerk.	10 00
July 14	M. F. Pleasnats	Clerk United States circuit court, Richmond, Va., for fees in sundry post-office cases.	82 25

Amounts paid by the Department on drafts, &c.—Continued.

Date.	To whom allowed.	For what object.	Amount.
1873.			
July 14	G. R. Hill	Clerk United States district court, Oxford, Miss., for fees in sundry post-office cases.	$57 29
14	A. M. Hughes	United States attorney, Tenn., for fees in two post-office cases.	40 00
14	J. H. Pierce	United States marshal, Oxford, Miss., for fees in sundry post-office cases.	74 86
17	J. M. Tomeny	Late United States marshal, Tenn., for fees in case of United States *vs.* M. C. Galloway, late postmaster at Memphis, Tenn.	158 00
18	A. Sterling, jr	United States attorney, Maryland, for fees in the case of United States *vs.* William J. Norris, late postmaster at Great Mills, Md.	20 00
26	N. Trusler	United States district attorney, Indiana, for fees in sundry post-office cases.	30 00
Aug. 20	E. W. Barber	Washington, D. C., for expenses incurred while traveling on business for the Post-Office Department.	32 50
Sept. 19	E. R. Campbell	Clerk United States circuit court, Nashville, Tenn., for fees in sundry post-office cases.	17 95

Amount allowed to the postmasters at the principal offices of the United States for incidental expenses of such offices actually and necessarily incurred, such as rent, fuel, stationery, lights, office-repairs, printing, gas-fixtures, &c.

Third quarter, 1872	$108,271 32
Fourth quarter, 1872	118,525 56
First quarter, 1873	126,617 33
Second quarter, 1873	145,377 11
Total	498,791 32
Amount paid to postmasters and others	8,094 88
Amount paid by warrants	125,622 95
Amount paid by drafts	38,432 45
Total	670,941 60
Deduct amounts charged to postmasters for over-credits	1,050 90
Amount actually paid and charged to miscellaneous account	669,890 70

J. J. MARTIN,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 6.—*Statement showing the transactions of the money-order office of the United States for the fiscal year ending June* 30, 1873.

States and Territories	Number of orders issued.	Balance from last year.	Amount of orders issued.	Revenue.		Drafts and deposits received.	Balance due postmasters.	Transferred from—			
				Total fees received.	Premiums.			Postage fund.	Swiss fund.	British fund.	German fund.
Alabama	42,983	$18,018 53	$902,608 75	$5,319 45	$72 93	$382,746 19	.....	$2,350 53	$652 25	$1,885 89	$2,545 77
Arizona Territory	3,902	8,995 75	156,422 80	807 95	.....	.....	.....	52 00	.....	806 24	127 00
Arkansas	35,273	31,187 38	958,601 02	5,302 70	.....	503,373 00	$31 04	885 03	.....	2,476 87	1,180 63
California	54,920	14,087 30	1,391,863 89	7,791 40	.....	1,136,525 00	48 34	5,907 66	1,366 00	37,297 00	30,131 75
Colorado Territory	20,626	11,271 63	476,224 60	2,700 95	.....	296,650 73	32 59	863 00	119 00	18,732 00	491 00
Connecticut	61,581	6,821 95	938,384 72	5,974 75	.....	413,774 00	.....	17,550 87	400 00	40,486 16	4,247 00
Dakota Territory	2,384	519 95	52,860 17	303 35	.....	.....	.....	75 00	.....	53 00	137 25
Delaware	8,631	1,278 37	132,043 83	838 05	.....	10,025 00	2 87	2,370 00	116 00	2,965 58	120 00
District of Columbia	23,178	12,982 58	460,335 65	2,663 70	.....	1,168,327 13	.....	.....	1,447 00	6,977 00	6,754 00
Florida	25,368	15,032 63	731,766 87	4,003 25	.....	87,512 00	.....	10 00	73 00	6,282 00	936 00
Georgia	48,541	46,455 15	864,719 13	5,299 20	.....	921,535 43	24 28	441 00	15 00	5,516 52	4,292 25
Idaho Territory	4,287	6,051 96	143,330 00	761 25	.....	.....	.....	512 00	.....	7,100 00	311 50
Illinois	365,053	106,379 20	5,410,188 97	34,848 20	.....	4,938,960 70	156 01	46,951 75	4,970 96	115,242 49	24,039 79
Indiana	190,732	34,146 17	2,822,974 04	18,155 15	.....	1,009,312 29	68 48	14,282 07	1,039 00	20,737 07	5,383 48
Iowa	210,340	34,643 59	3,112,493 49	20,210 15	.....	1,102,829 96	71 35	11,509 97	661 22	8,570 87	5,655 69
Kansas	81,165	19,836 88	1,423,662 88	8,782 70	01	494,461 19	144 19	11,566 34	153 00	3,205 35	1,751 00
Kentucky	62,835	11,651 92	1,023,829 33	6,430 15	.....	685,897 31	67 15	16,030 00	988 25	6,669 25	3,232 69
Louisiana	30,681	42,885 77	744,336 07	4,192 25	.....	1,237,255 52	18 63	309 63	424 00	9,854 00	1,934 00
Maine	52,549	9,133 56	1,061,246 09	6,291 60	.....	497,539 00	75 88	8,691 18	.....	101,879 15	713 00
Maryland	42,707	7,662 18	756,323 33	4,608 50	.....	994,371 00	46 13	4,801 96	324 00	8,169 73	12,989 71
Massachusetts	121,918	21,990 20	2,176,362 89	13,146 00	.....	1,663,493 54	225 26	38,774 68	1,207 50	149,370 70	14,069 33
Michigan	178,731	43,117 70	2,924,096 50	18,238 10	.....	1,538,593 50	118 81	24,641 15	1,952 00	35,291 93	7,578 98
Minnesota	77,628	21,517 96	1,276,850 08	7,984 20	.....	543,252 00	2 99	4,517 44	455 46	4,653 00	2,177 93
Mississippi	54,998	15,747 13	1,097,461 06	6,562 10	6 42	1,000 00	.....	553 95	.....	2,486 17	701 10
Missouri	141,426	29,485 95	2,370,110 23	14,707 05	.....	2,448,729 41	70 75	27,642 36	1,883 00	14,908 12	4,349 06
Montana Territory	5,918	8,578 97	148,109 33	835 00	.....	.....	.....	314 52	.....	2,077 00	1,374 63
Nebraska	37,317	18,444 73	685,668 09	4,151 65	.....	917,020 01	28 88	14,571 67	87 00	4,744 32	633 80
Nevada	7,458	3,261 63	234,658 61	1,258 25	.....	.....	.....	.....	436 00	10,359 76	1,395 00
New Hampshire	38,996	5,536 52	626,335 13	3,951 00	.....	76,475 00	27 38	7,733 45	.....	16,933 49	1,314 95
New Jersey	45,318	7,874 45	766,259 42	4,713 50	.....	92,825 00	468 85	22,242 41	1,400 00	72,349 68	8,332 00
New Mexico Territory	1,978	790 20	67,597 55	357 90	.....	.....	.....	104 00	.....	79 58	.....
New York	258,991	229,463 63	4,110,020 02	25,729 60	.....	14,737,963 42	425 00	112,923 43	46,052 23	207,221 21	77,619 63
North Carolina	43,375	10,860 24	907,005 16	5,369 70	.....	132,811 00	11 99	4,814 00	6 00	938 97	2,159 14
Ohio	279,486	43,397 81	3,985,519 38	26,012 15	.....	2,778,020 84	688 32	49,316 36	2,048 00	75,757 30	22,745 79
Oregon	14,753	20,527 43	325,954 04	1,902 10	.....	232,486 00	5 37	1,576 61	622 00	5,045 21	2,796 00
Pennsylvania	191,767	32,879 53	2,999,513 07	18,855 15	10 26	2,044,800 49	280 74	51,409 22	2,522 00	114,962 72	13,856 47
Rhode Island	18,926	2,119 89	330,688 85	2,005 85	.....	129,952 00	.....	1,139 00	268 00	39,848 13	1,168 00

South Carolina	30,087	6,773 24	524,888 92	3,241 40	124 79	326,894 26	10 98	150 00		1,286 00	824 00
Tennessee	75,979	34,948 30	1,530,137 56	9,058 15		1,739,418 76	17 53	2,989 54	3,477 00	6,658 00	1,957 00
Texas	45,954	21,971 74	1,080,105 60	6,153 80		19,886 00		8,678 61	469 75	9,157 18	6,661 01
Utah Territory	7,323	4,548 43	205,465 55	1,117 30		1,900 00	22 10	936 00	1,864 00	8,049 00	592 00
Vermont	39,335	6,000 30	628,887 53	3,982 50		88,250 00	50 66	7,831 13		6,936 30	286 00
Virginia	57,914	18,422 88	1,163,518 81	6,860 85		1,453,360 00		7,554 76	916 15	15,427 00	2,536 00
Washington Territory	5,436	3,799 75	149,627 17	825 45		8,192 00	4 33	597 19		1,596 00	389 00
West Virginia	25,561	5,506 78	431,052 18	2,661 35		52,700 00		1,481 00	41 60	3,782 29	1,127 00
Wisconsin	175,827	41,249 93	3,060,672 24	18,831 45		1,980,733 00	221 15	10,004 76	1,566 50	17,263 85	11,631 85
Wyoming Territory	5,550	686 86	145,434 09	806 00						948 00	86 00
Total	3,355,686	1,098,535 63	57,516,214 69	354,602 25	214 41	48,889,851 68	3,468 03	547,657 23	80,022 27	1,233,037 08	295,335 18

No. 6.—*Statement showing the transactions of the money-order office of the United States for the fiscal year ending June* 30, 1873—Continued.

States and Territories.	Number of orders paid.	Amount of orders paid.	Amount of orders repaid.	Transferred to—				Deposited.	Expenses.	Commissions and clerk hire.	Balance due the United States.	Miscellaneous items.
				Postage fund.	Swiss fund.	British fund.	German fund.					
Alabama	17,598	$396,196 03	$5,081 74	$600 00	.....	$534 91	$512 12	$892,384 93	$614 34	$2,691 74	$17,584 48	.....
Arizona Territory	469	19,370 61	926 05	.....	.....	383 37	.....	133,028 70	.....	317 58	13,185 43	.....
Arkansas	11,079	325,578 92	7,958 99	44,219 00	.....	224 47	614 00	1,093,222 00	1,601 52	2,223 94	27,394 83	.....
California	26,014	857,956 59	9,489 56	203 00	$267 00	909 54	2,278 85	1,730,881 00	573 90	7,876 73	14,570 28	$11 89
Colorado Territory	9,790	276,232 03	3,852 93	.....	.....	984 00	70 00	502,858 73	117 70	1,704 24	21,248 36	17 51
Connecticut	54,847	882,518 30	5,534 40	.....	132 09	1,037 86	1,640 10	523,858 79	24 43	3,900 16	8,983 95	9 37
Dakota Territory	522	12,354 30	541 40	.....	.....	105 56	572 16	39,191 96	223 54	131 96	823 16	4 68
Delaware	5,603	104,193 74	738 52	220 00	.....	106 00	8 86	41,203 00	144 97	539 71	2,598 62	6 28
District of Columbia	29,161	533,174 94	3,170 91	.....	115 00	.....	541 00	1,102,858 00	3,263 48	4,327 75	12,035 98	.....
Florida	7,515	209,222 50	3,819 06	700 00	1 00	59 00	232 00	600,447 05	1,013 03	1,857 33	28,264 78	.....
Georgia	35,362	715,268 33	5,545 59	894 00	.....	211 00	209 12	1,070,835 80	1,008 41	2,849 49	51,399 71	76 51
Idaho Territory	579	22,693 44	472 75	4,351 00	1 00	2 00	32	122,886 00	360 37	310 42	6,989 41	.....
Illinois	429,681	6,315,932 75	37,710 16	4,781 05	663 85	4,754 70	19,101 43	4,192,409 00	3,336 66	21,771 41	81,086 61	181 45
Indiana	98,392	1,772,769 49	17,565 79	3,196 34	281 05	1,981 41	6,669 13	2,068,861 26	195 80	9,404 77	45,038 67	134 04
Iowa	124,905	2,318,741 13	20,944 15	715 69	616 00	2,531 61	12,663 17	1,883,459 10	106 80	11,720 22	45,057 75	90 67
Kansas	52,095	1,230,463 39	9,678 46	203 48	146 22	5,486 86	5,766 77	680,129 02	71 40	5,717 77	25,662 79	237 38
Kentucky	64,633	1,176,679 47	7,266 28	7,700 00	571 00	564 06	1,412 59	544,883 25	59 32	3,618 94	12,011 03	30 11
Louisiana	32,543	911,434 30	5,182 99	.....	539 00	102 00	2,278 00	1,087,560 78	30 80	4,125 04	29,956 96	.....
Maine	46,038	945,425 52	4,473 90	94 55	.....	987 65	180 00	706,217 19	126 26	4,354 38	22,858 92	851 09
Maryland	67,178	1,493,682 60	4,363 53	.....	21 45	573 01	582 73	275,234 66	75	4,469 24	10,358 01	10 56
Massachusetts	201,459	3,074,891 38	13,665 99	700 00	2 18	1,299 28	1,124 93	936,168 72	238 13	12,288 41	37,913 24	347 84
Michigan	118,525	2,185,824 69	22,749 24	594 60	247 10	2,725 44	7,030 52	2,309,313 50	25 21	11,183 77	53,774 75	159 85
Minnesota	41,426	885,401 42	9,916 91	50 00	356 17	1,393 10	12,768 15	923,401 00	22 00	4,329 86	23,696 29	76 16
Mississippi	12,258	255,977 13	6,891 93	.....	15 05	664 43	49 10	841,944 74	1,200 40	2,576 81	15,198 34	.....
Missouri	180,110	3,672,525 89	17,426 51	228 89	693 04	2,751 73	16,330 10	1,154,498 20	136 35	12,446 81	34,776 86	71 55
Montana Territory	1,505	46,125 42	1,045 09	.....	.....	.....	.....	109,425 00	7 00	441 20	4,245 74	.....
Nebraska	33,667	606,355 59	5,195 91	2 00	266 00	3,555 00	7,160 49	1,003,255 01	305 76	2,902 72	16,303 87	47 89
Nevada	1,087	38,719 70	1,800 15	.....	87 00	27 57	.....	207,078 00	8 50	557 77	3,090 56	.....
New Hampshire	28,243	484,167 09	2,903 23	266 59	.....	582 76	9 00	241,667 03	19 30	2,527 00	6,023 71	141 21
New Jersey	38,150	692,503 41	4,395 42	.....	155 00	1,626 06	7,023 19	259,597 57	28 75	2,994 70	8,005 34	135 87
New Mexico Territory	407	14,598 14	64 05	.....	.....	.....	.....	52,215 00	.....	155 78	1,896 26	.....
New York	659,448	8,903,233 12	35,475 65	632,560 36	53,430 48	1,151,789 80	59,985 96	8,421,723 62	7,434 27	45,337 65	236,063 48	383 78
North Carolina	16,060	338,570 73	3,978 22	6,437 00	.....	474 00	125 05	698,180 00	15 25	2,636 05	13,541 15	18 75
Ohio	308,186	4,800,010 44	27,465 37	14,939 70	1,282 00	3,324 45	5,701 68	2,058,791 14	238 13	16,600 42	54,204 13	948 49
Oregon	5,254	180,536 05	3,288 96	.....	11 00	85 07	131 00	395,778 00	3 61	1,357 60	9,723 47	.....
Pennsylvania	242,997	3,619,870 15	25,156 41	4,250 00	900 00	3,830 82	13,451 41	1,550,769 04	2,371 29	13,772 28	44,339 13	379 12
Rhode Island	11,908	244,126 91	1,852 26	.....	170 00	176 00	101 59	256,679 00	7 00	1,157 76	2,919 20	.....

South Carolina	17,636	333,664 36	2,853 49	.....	.....	131 00	23 00	516,193 26	5 50	1,815 78	9,507 20	.....
Tennessee	57,750	1,217,014 36	8,539 37	942 33	1,830 00	588 00	2,411 00	2,052,566 00	2,965 92	5,480 46	36,269 36	55 04
Texas	15,986	449,776 24	8,275 20	21 84	1,192 04	742 31	2,979 21	644,467 83	19 25	2,430 11	43,179 66	.....
Utah Territory	2,757	85,957 29	734 00	.....	.....	420 00	781 78	132,910 00	.....	402 50	3,288 81	.....
Vermont	25,254	456,623 71	3,471 05	285 00	.....	394 78	102 85	271,032 40	.....	2,468 73	7,777 65	68 25
Virginia	46,864	1,044,067 67	5,736 04	42 25	.....	2,610 00	1,342 00	1,589,300 45	57 74	4,495 59	20,928 25	16 46
Washington Territory	1,916	71,893 56	1,488 20	.....	.....	320 44	140 00	88,954 00	7 75	454 85	1,772 09	.....
West Virginia	11,735	234,053 77	2,594 09	1 00	140 00	136 41	511 00	253,417 55	126 53	1,230 35	6,090 88	50 02
Wisconsin	119,331	2,420,117 06	22,174 23	1,173 78	2,896 61	6,349 07	28,044 93	2,592,943 00	186 96	11,642 54	56,522 68	123 87
Wyoming Territory	895	23,857 66	1,206 91	.....	.....	5 60	19 44	119,824 00	.....	328 26	2,719 08	.....
Total	3,314,818	56,900,351 23	394,661 04	730,373 45	67,028 33	1,207,542 13	222,679 73	48,974,503 28	28,304 08	257,928 58	1,230,880 91	4,685 69

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 7.—*Statement of the receipts and disbursements of the money-order office for the fiscal year ended June* 30, 1873.

RECEIPTS.

Balance in hands of postmasters June 30, 1872	$1,098,535 63
Amount received for money-orders issued	57,516,214 69
Amount received for fees	354,602 25
Amount received for premiums, &c	214 41
Amount received for deposits and drafts	48,889,851 68
Amount due postmasters	3,468 03
Amount transferred from postage-fund	547,657 23
Amount transferred from Swiss fund	80,022 27
Amount transferred from British fund	1,233,037 08
Amount transferred from German fund	295,335 18
	110,018,938 45

DISBURSEMENTS.

Amount of money-orders paid	$56,900,351 23
Amount of money-orders repaid	394,661 04
Amount transferred to postage-fund	730,373 45
Amount transferred to Swiss fund	67,028 33
Amount transferred to British fund	1,207,542 13
Amount transferred to German fund	222,679 73
Amount deposited at first-class offices	48,974,503 28
Amount paid for incidental expenses	28,304 08
Amount paid for clerk-hire and commissions	257,928 58
Miscellaneous items	4,685 69
Balance in hands of postmasters June 30, 1873	1,230,880 91
	110,018,938 45

J. J. MARTIN,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 8.—*Statement of revenue accrued to the money-order office for the fiscal year ended June* 30, 1873.

Total amount of fees received	$354,602 25
Total amount of premiums, &c	214 41
	354,816 66

Commissions and clerk-hire	$257,928 58
Lost remittances	4,345 56
Bad debts	957 20
Incidental expenses	23,001 32
Net revenue	68,584 00
	354,816 66

J. J. MARTIN,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 9.—*Statement showing the transactions of the money-order office with the United Kingdom of Great Britain and Ireland for the fiscal year ended June 30, 1873.*

States and Territories.	Number of orders issued.	Balance from last year.	Amount of orders issued.	Revenue.	Balance due postmasters.	Transferred from domestic money-order funds.	Number of orders paid.	Amount of orders paid.	Amount of orders repaid.	Transferred to domestic money-order funds.	Amount paid United Kingdom.	Expenses.	Commissions and clerk-hire.	Balance due the United States.	Miscellan'us items.
				Total fees received.											
Alabama	97	$2 18	$1,958 11	$55 25	$0 74	$534 91	29	$663 25	.....	$1,885 89	.....	.....	$1 61	$0 24	$0 20
Arizona Territory	20	25	737 25	19 00	2 02	383 37	11	282 93	.....	806 24	.....	.....	2 53	50 19	.....
Arkansas	95	49 66	2,497 25	68 50	.....	224 47	14	311 06	.....	2,476 87	.....	.....	1 23	50 72	.....
California	1,747	428 37	38,196 19	1,117 00	3 44	909 54	153	2,960 69	$158 83	37,297 00	.....	.....	43 52	192 16	2 34
Colorado Territory	740	73 89	19,238 40	524 00	5 20	984 00	81	1,975 65	10 00	18,732 00	.....	.....	26 35	74 08	7 41
Connecticut	2,687	166 11	42,324 03	1,337 75	5 41	1,037 86	195	3,683 92	146 15	40,486 16	.....	.....	50 59	499 46	4 88
Dakota Territory	1	49 77	20 00	50	.....	105 56	3	72 24	.....	53 00	.....	.....	22	50 37	.....
Delaware	225	.....	3,620 21	111 75	3 16	106 00	42	858 61	2 68	2,965 58	.....	.....	11 17	.....	3 08
District of Columbia	383	99	7,279 82	221 50	.....	.....	38	473 90	50 99	6,977 00	.....	.....	.....	42	.....
Florida	181	24 28	6,225 25	162 50	2 65	59 00	5	133 69	.....	6,282 00	.....	.....	15 86	41 27	86
Georgia	251	5 20	5,681 61	156 25	.....	211 00	23	478 40	.....	5,516 52	.....	.....	08	58 60	46
Idaho Territory	216	.....	6,975 45	188 50	29	2 00	.....	.....	.....	7,100 00	.....	.....	17 43	47 52	1 29
Illinois	6,031	866 35	125,862 39	3,649 00	7 13	4,754 70	894	18,064 23	523 51	115,242 49	.....	.....	79 59	1,223 17	6 58
Indiana	1,086	329 57	22,369 37	647 50	81	1,981 41	134	2,943 09	29 00	20,737 07	.....	.....	29 13	1,590 37	.....
Iowa	578	230 23	9,816 60	299 00	1 03	2,531 61	175	3,716 83	37 75	8,570 87	.....	.....	19 43	527 79	5 80
Kansas	268	79 22	4,751 91	141 50	91	5,486 86	277	6,889 08	18 00	3,205 35	.....	.....	21 30	325 25	1 42
Kentucky	352	53	7,333 87	215 75	13 33	564 06	55	1,242 91	31 00	6,669 25	.....	.....	11 82	172 01	55
Louisiana	434	55 86	11,020 45	302 00	.....	102 00	77	1,576 58	.....	9,854 00	.....	.....	1 70	48 03	.....
Maine	2,761	210 05	100,205 07	2,579 00	55 41	987 65	59	1,432 48	40 00	101,879 15	.....	.....	244 07	405 89	35 59
Maryland	574	38 43	9,630 91	296 75	4 28	573 01	117	2,141 35	192 50	8,169 73	.....	.....	15 23	21 85	2 72
Massachusetts	8,625	174 85	163,627 72	4,935 75	10 20	1,299 28	947	18,137 96	463 69	149,370 70	.....	$595 00	138 41	1,336 52	5 52
Michigan	2,046	294 44	39,225 16	1,153 25	6 79	2,725 44	307	6,502 14	115 55	35,291 93	.....	.....	72 69	1,415 58	7 19
Minnesota	273	159 31	5,211 82	153 75	7 29	1,393 10	82	1,969 89	3 75	4,653 00	.....	.....	9 73	287 66	1 24
Mississippi	124	366 75	2,367 67	67 75	17	664 43	35	798 26	106 00	2,486 17	.....	.....	6 11	68 93	1 30
Missouri	1,086	339 63	20,319 63	596 75	70	2,751 73	388	8,255 63	51 00	14,908 12	.....	.....	13 51	779 35	83
Montana Territory	61	92	2,036 35	53 25	.....	.....	1	11 10	.....	2,077 00	.....	.....	1 12	1 30	.....
Nebraska	260	109 65	5,560 05	157 25	45	3,555 00	181	4,483 09	.....	4,744 32	.....	.....	19 15	135 69	15
Nevada	430	49 17	10,192 66	298 00	2 15	27 57	5	147 43	.....	10,359 76	.....	.....	11 09	50 41	86
New Hampshire	859	169 29	17,568 17	514 00	5 98	582 76	58	1,229 98	6 00	16,933 49	.....	.....	46 83	622 76	1 14
New Jersey	4,943	104 56	78,739 35	2,498 75	13 63	1,626 06	510	10,015 02	204 04	72,349 68	.....	.....	108 63	280 22	24 76
New Mexico Territory	4	.....	88 00	2 75	15	.....	1	11 08	.....	79 58	.....	.....	24	.....	.....
New York	14,316	637 67	255,781 70	7,871 00	23 66	1,151,789 80	3,375	59,932 56	1,039 32	207,221 21	$1,131,684	34 40	13,334 98	2,854 46	2 90
North Carolina	47	1 15	1,086 99	30 75	.....	474 00	25	619 06	22 50	938 97	.....	.....	4 23	7 60	53
Ohio	4,350	274 07	82,761 00	2,478 50	6 74	3,324 45	537	11,092 24	196 32	75,757 30	.....	.....	95 08	1,699 33	4 49
Oregon	186	47 80	5,055 68	140 00	1 40	85 07	12	225 89	.....	5,045 21	.....	.....	7 64	51 21	.....
Pennsylvania	7,539	546 32	132,639 17	4,040 25	10 92	3,830 82	1,157	22,789 33	277 07	114,962 72	.....	.....	252 49	2,772 02	13 85

No. 9.—*Statement showing the transactions of the money-order office with the United Kingdom of Great Britain and Ireland, &c.*—Continued.

States and Territories.	Number of orders issued.	Balance from last year.	Amount of orders issued.	Revenue. Total fees received.	Balance due postmasters.	Transferred from domestic money-order funds.	Number of orders paid.	Amount of orders paid.	Amount of orders repaid.	Transferred to domestic money-order funds.	Amount paid United Kingdom.	Expenses.	Commissions and clerk-hire.	Balance due the United States.	Miscellan'us items.
Rhode Island	2,098	$0 51	$40,417 34	$1,217 25	$10 14	$176 00	102	$1,791 12	$74 58	$39,848 13	.....	.....	$53 43	$48 68	$5 30
South Carolina	44	118 80	1,200 00	33 25	.....	131 00	12	192 62	.....	1,286 00	.....	.....	2 38	67	1 38
Tennessee	383	61 26	7,728 59	226 25	73	588 00	92	1,830 11	.....	6,658 00	.....	.....	3 70	113 02	.....
Texas	402	1 62	9,685 50	270 00	26 75	742 31	66	1,457 11	65 90	9,157 18	.....	.....	4 39	40 47	1 13
Utah Territory	612	65 27	10,129 70	308 75	.....	420 00	108	2,767 85	95 75	8,049 00	.....	.....	.....	11 12	.....
Vermont	412	145 70	7,624 10	233 25	42	394 78	27	661 17	247 00	6,936 30	.....	.....	20 64	532 06	1 08
Virginia	589	2 18	16,349 46	443 50	1 21	2,610 00	161	3,840 28	55 50	15,427 00	.....	.....	13 45	69 71	41
Washington Territory	53	36	1,690 88	45 25	.....	320 44	15	431 34	.....	1,596 00	.....	.....	5 30	23 39	90
West Virginia	211	2 55	3,736 53	114 00	98	136 41	13	201 72	.....	3,782 29	.....	.....	4 59	78	1 09
Wisconsin	875	188 75	16,985 20	502 25	4 97	6,349 07	245	5,787 14	71 25	17,263 85	.....	.....	32 79	872 40	2 81
Wyoming Territory	37	73	923 76	25 75	08	5 60	1	5 60	.....	948 00	.....	.....	2 32	.....	.....
Total	69,592	6,474 25	1,364,476 32	40,504 25	241 32	1,207,542 13	10,845	215,087 61	4,335 63	1,233,037 08	$1,131,684	$629 40	14,857 78	19,454 73	152 04

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 10.—*Statement of receipts and disbursements of the money-order office with the United Kingdom of Great Britain and Ireland for the fiscal year ended June* 30, 1873.

RECEIPTS.

Balance in hands of postmasters June 30, 1872	$6,474 25
Amount of orders issued	1,364,476 32
Amount of fees received	40,504 25
Amount transferred to domestic fund	1,207,542 13
Balance due postmasters	241 32
	2,619,238 27

DISBURSEMENTS.

Amount of orders paid	$215,087 61
Amount of orders repaid	4,335 63
Amount transferred to domestic fund	1,233,037 08
Amount paid United Kingdom	1,131,684 00
Amount paid for incidental expenses	629 40
Amount paid for commissions and clerk-hire	14,857 78
Miscellaneous items	152 04
Balance in hands of postmasters June 30, 1873	19,454 73
	2,619,238 27

J. J. MARTIN,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 11.—*Statement of revenue accrued on money-order transactions with the Kingdom of Great Britain and Ireland for the fiscal year ended June* 30, 1873.

Balance in hands of postmasters June 30, 1872	$6,474 25
Excess of transfers to domestic money-order fund	142,787 87
	149,262 12
Amounts paid London office—	
July 9, 1872	$35,551 98
July 25, 1872	35,981 99
August 29, 1872	16,459 68
December 23, 1872	37,946 55
	125,940 20
Net revenue	23,321 92
	149,262 12

J. J. MARTIN,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

NOTE.—The excess of $10,686.93 in revenue over the fees received on orders issued, after deducting expenses, is the gain resulting from the purchase of bills of exchange.

No. 12.—*Statement showing the transactions of the money-order office with Switzerland for the fiscal year ended June 30, 1873*

States and Territories.	Number of orders issued.	Balance from last year.	Amount of orders issued.	Revenue, total fees received.	Balance due postmasters.	Transferred from domestic money-order fund.	Number of orders paid.	Amount of orders paid.	Amount of orders repaid.	Transferred to domestic money-order fund.	Amount paid Switzerland.	Expenses.	Commissions and clerk-hire.	Balance due the United States.	Miscellaneous items.
Alabama	14	$0 85	$637 00	$16 00	.....	.....	.....	.....	.....	$652 25	.....	.....	$0 02	$1 58	.....
Arkansas	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
California	63	25 46	1,303 85	39 50	.....	$267 00	11	$266 98	.....	1,366 00	.....	.....	86	1 97	.....
Colorado Territory	6	.....	115 75	3 50	.....	.....	.....	.....	.....	119 00	.....	.....	.....	25	.....
Connecticut	13	85	389 20	10 50	.....	132 09	4	132 58	.....	400 00	.....	.....	.....	06	.....
Delaware	6	39	112 50	3 25	$0 14	.....	.....	.....	.....	116 00	.....	.....	28	.....	.....
District of Columbia	47	01	1,646 39	43 25	.....	115 00	15	357 57	.....	1,447 00	.....	.....	.....	08	.....
Florida	3	55 50	71 00	2 00	.....	1 00	.....	.....	.....	73 00	.....	.....	18	56 32	.....
Georgia	1	37	15 00	50	.....	.....	.....	.....	.....	15 00	.....	.....	.....	87	.....
Idaho Territory	.....	.....	.....	.....	.....	1 00	.....	.....	.....	.....	.....	.....	.....	97	$0 03
Illinois	163	43 75	5,030 72	137 50	.....	663 85	36	902 75	.....	4,970 96	.....	.....	34	1 74	03
Indiana	51	80 41	1,041 10	29 75	.....	281 05	11	296 13	.....	1,039 00	.....	.....	09	97 09	.....
Iowa	33	2 69	653 75	19 50	.....	616 00	21	627 78	.....	661 22	.....	.....	58	2 33	03
Kansas	4	97	180 00	4 50	30	146 22	7	146 44	.....	153 00	.....	.....	30	32 14	11
Kentucky	39	85	971 30	26 75	.....	571 00	19	576 53	.....	988 25	.....	.....	.....	5 12	.....
Louisiana	19	45	455 00	12 75	.....	539 00	17	560 80	.....	424 00	.....	.....	06	87	21 47
Maine	.....	50 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50 00	.....
Maryland	19	44	357 92	10 00	.....	21 45	1	43 60	.....	324 00	.....	.....	.....	76	21 45
Massachusetts	47	10	1,181 41	32 25	.....	2 18	1	2 18	.....	1,207 50	.....	.....	.....	6 26	.....
Michigan	75	35 49	1,940 90	53 50	.....	247 10	11	320 87	.....	1,952 00	.....	.....	45	3 67	.....
Minnesota	15	14 89	430 00	11 75	10	356 17	12	356 04	.....	455 46	.....	.....	98	43	.....
Mississippi	.....	89	.....	.....	04	15 05	1	15 94	.....	.....	.....	.....	04	.....	.....
Missouri	73	13 18	2,021 85	54 50	02	693 04	32	894 34	.....	1,883 00	.....	.....	91	2 02	2 32
Montana Territory	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nebraska	3	60	85 00	2 25	.....	266 00	8	266 67	.....	87 00	.....	.....	.....	18	.....
Nevada	16	47	423 85	12 50	.....	87 00	2	87 76	.....	436 00	.....	.....	.....	06	.....
New Hampshire	.....	07	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	07	.....
New Jersey	62	1 33	1,386 27	38 25	.....	155 00	7	177 44	.....	1,400 00	.....	.....	49	2 92	.....
New York	1,594	2,050 65	44,842 17	1,248 00	.....	53,430 48	116	2,829 46	$63 39	46,052 23	$52,558 38	$5 50	1 03	61 31	.....
North Carolina	1	1 87	5 00	25	.....	.....	.....	.....	.....	6 00	.....	.....	01	1 11	.....
Ohio	98	54 79	2,385 90	67 75	.....	1,282 00	58	1,652 35	20 00	2,048 00	.....	.....	82	69 05	22
Oregon	15	10	607 00	15 50	.....	11 00	1	11 02	.....	622 00	.....	.....	.....	58	.....
Pennsylvania	91	25 46	2,551 20	70 50	.....	900 00	31	973 25	4 39	2,522 00	.....	.....	66	56 86	.....
Rhode Island	15	70	282 65	8 00	.....	170 00	8	193 08	.....	268 00	.....	.....	.....	27	.....
South Carolina	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee	100	51 17	3,443 76	90 75	31	1,830 00	67	1,837 12	.....	3,477 00	.....	.....	6 80	95 07	.....
Texas	12	.....	478 00	12 25	.....	1,192 04	35	1,211 75	.....	469 75	.....	.....	.....	46	33

Utah Territory	45	18	1,818 00	46 50	.....	.....	.....	.....	.....	1,864 00	.....	.....	.....	68	.....
Vermont	.....	17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17	.....
Virginia	23	51 76	851 84	22 25	14	.....	1	7 85	.....	916 15	.....	.....	35	1 64	.....
West Virginia	4	10	39 85	1 50	.....	140 00	4	139 06	.....	41 00	.....	.....	01	1 30	08
Wisconsin	31	31 52	558 80	16 50	63	2,896 61	63	1,922 24	10 00	1,566 50	.....	.....	4 10	1 16	06
Wyoming Territory	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	2,801	2,608 48	78,313 93	2,164 00	1 68	67,028 33	600	16,809 58	97 78	80,022 27	52,558 38	5 50	19 36	557 42	46 13

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 13.—*Statement of receipts and disbursements of the money-order office with Switzerland for the fiscal year ended June* 30, 1873.

RECEIPTS.

Balance in hands of postmasters June 30, 1872	$2,608 48
Amount of orders issued	78,313 93
Amount of fees received	2,164 00
Amount transferred from domestic fund	67,028 33
Amount due postmasters	1 68
	150,116 42

DISBURSEMENTS.

Amount of orders paid	$16,809 58
Amount of orders repaid	97 78
Amount transferred to domestic fund	80,022 27
Amount paid Switzerland	52,558 38
Amount incidental expenses	5 50
Amount allowed for commissions and clerk-hire	19 36
Miscellaneous items	46 13
Balance in hands of postmasters June 30, 1873	557 42
	150,116 42

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 14.—*Statement of revenue accrued on money-order transactions with Switzerland for the fiscal year ended June* 30, 1873.

Balance in hands of postmasters June 30, 1873	$557 42
Excess of transfers to domestic money-order fund	12,993 94
	13,551 36
Amounts paid Switzerland:	
July 15, 1873	$19,387 74
August 19, 1873	13,797 57
August 29, 1873	10,157 71
October 2, 1873	565 10
	43,908 12
* Deduct payment of October 1, 1872	35,509 52
	8,398 60
Net revenue	5,152 76
	13,551 36

* Included in statement for fiscal year ended June 30, 1872.

NOTE.—The excess of $3,013.62 in revenue over the fees received on orders issued, after deducting expenses, is the gain resulting from the purchase of bills of exchange.

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 15.—*Statement showing the transactions of the money-order office with the German Empire from October 1, 1872, to June 30, 1873.*

States and Territories.	Number of orders issued.	Amount of orders issued.	Revenue—total fees received.	Balance due postmasters.	Transferred from domestic money-order fund.	Number of orders paid.	Amount of orders paid.	Amount of orders repaid.	Transferred to domestic money-order fund.	Amount paid German Empire.	Expenses.	Commissions and clerk-hire.	Balance due the United States.
Alabama	101	$2,671 20	$72 05	.....	$512 12	21	$708 96	.....	$2,545 77	.....	.....	.....	$0 64
Arizona Territory	4	124 25	3 50	.....	.....	.....	.....	.....	127 00	.....	.....	$0 31	44
Arkansas	52	1,393 25	37 40	.....	614 00	24	729 86	.....	1,180 63	.....	.....	2 56	131 60
California	1,137	32,831 13	893 90	$2 59	2,278 85	202	5,705 41	$36 00	30,131 75	.....	$0 25	24 55	108 51
Colorado Territory	21	573 50	15 40	.....	70 00	4	94 69	.....	491 00	.....	.....	13	73 08
Connecticut	231	5,419 00	147 85	68	1,640 10	111	2,941 30	.....	4,247 00	.....	.....	4 92	14 41
Dakota Territory	7	140 00	3 55	.....	572 16	18	492 75	.....	137 25	.....	.....	1 58	84 13
Delaware	16	214 08	6 45	02	8 86	4	87 65	.....	120 00	.....	.....	76	21 00
District of Columbia	280	8,306 48	218 40	.....	541 00	83	2,311 52	.....	6,754 00	.....	.....	.....	36
Florida	30	915 00	24 15	19	232 00	8	231 35	.....	936 00	.....	.....	2 86	1 13
Georgia	144	4,274 53	113 60	.....	209 12	11	251 23	50 00	4,292 25	.....	1 25	.....	2 52
Idaho Territory	12	304 00	8 25	.....	32	.....	.....	.....	311 50	.....	.....	75	32
Illinois	2,223	45,345 28	1,260 60	8 28	19,101 43	1,521	40,981 83	281 60	24,039 79	.....	1 25	67 76	343 36
Indiana	380	6,430 71	185 35	61 26	6,669 13	278	7,631 72	75 00	5,383 48	.....	.....	11 42	244 83
Iowa	401	7,153 36	200 65	5 69	12,663 17	497	13,691 23	29 00	5,655 69	.....	25	31 46	615 24
Kansas	98	2,234 00	60 90	1 87	5,766 77	221	6,246 95	.....	1,751 00	.....	.....	8 40	57 19
Kentucky	216	4,708 30	128 35	96	1,412 59	99	2,884 84	.....	3,232 69	.....	.....	6 92	125 75
Louisiana	148	3,233 45	89 00	.....	2,278 00	135	3,566 59	.....	1,934 00	.....	.....	2 39	97 47
Maine	29	700 75	18 25	.....	180 00	7	184 61	.....	713 00	.....	.....	08	1 31
Maryland	925	17,369 85	485 80	84	582 73	232	5,446 38	.....	12,989 71	.....	.....	2 23	90
Massachusetts	576	15,657 84	421 30	91	1,124 93	118	2,985 71	23 75	14,069 33	.....	75	3 59	121 85
Michigan	622	12,472 23	343 75	2 47	7,030 52	432	12,062 43	70 50	7,578 98	.....	25	23 30	113 51
Minnesota	206	3,894 60	106 75	4 88	12,768 15	491	14,322 76	.....	2,177 93	.....	.....	28 76	244 93
Mississippi	31	706 25	19 90	14	49 10	2	66 51	.....	701 10	.....	.....	1 26	6 52
Missouri	509	9,652 55	266 80	3 44	16,330 10	800	21,598 15	56 00	4,349 06	.....	65	23 83	225 20
Montana Territory	41	1,396 00	35 65	.....	.....	2	56 12	.....	1,374 63	.....	.....	12	78
Nebraska	53	884 55	25 45	4 01	7,160 49	254	7,398 73	8 00	633 80	.....	.....	16 80	17 17
Nevada	49	1,359 68	36 70	.....	.....	.....	.....	.....	1,395 00	.....	.....	78	60
New Hampshire	57	1,290 00	34 95	1 53	9 00	2	16 37	.....	1,314 95	.....	.....	3 26	90
New Jersey	684	12,464 53	350 60	1 24	7,023 19	443	11,359 41	38 00	8,332 00	.....	15	20 47	89 53
New Mexico Territory	.....	.....	.....	59 53	.....	2	59 38	.....	.....	.....	.....	15	.....
New York	5,599	124,835 61	3,506 20	1 62	59,985 96	2,655	66,682 87	193 89	77,619 63	$42,512 67	299 75	906 44	114 14
North Carolina	67	2,140 34	56 10	2 97	125 05	5	138 51	18 00	2,159 14	.....	.....	5 68	3 13
Ohio	1,605	31,728 97	881 75	9 15	5,701 68	550	14,904 72	230 40	22,745 79	.....	.....	36 04	404 60
Oregon	108	2,783 27	77 00	.....	131 00	6	193 38	.....	2,796 00	.....	.....	53	1 36
Pennsylvania	1,174	22,046 01	611 75	8 81	13,451 41	858	21,972 18	42 00	13,856 47	.....	1 90	47 62	197 81
Rhode Island	63	1,210 68	34 80	.....	101 59	8	178 33	.....	1,168 00	.....	.....	.....	74
South Carolina	34	823 65	22 60	.....	23 00	2	44 04	.....	824 00	.....	.....	45	76

No. 15.—*Statement showing the transactions of the money-order office with the German Empire, &c.*—Continued.

States and Territories.	Number of orders issued.	Amount of orders issued.	Revenue—total fees received.	Balance due postmasters.	Transferred from domestic money-order fund.	Number of orders paid.	Amount of orders paid.	Amount of orders repaid.	Transferred to domestic money-order fund.	Amount paid German Empire.	Expenses.	Commissions and clerk-hire.	Balance due the United States.
Tennessee	96	$2,230 61	$62 90	$0 08	$2,411 00	97	$2,701 36	.....	$1,957 00	.....	.....	$4 25	$41 98
Texas	313	8,236 37	221 15	3 86	2,979 21	164	4,580 20	$122 00	6,661 01	.....	$3 15	14 49	59 74
Utah Territory	21	580 50	15 40	16	781 78	27	769 27	15 00	592 00	.....	.....	60	97
Vermont	8	278 75	7 40	26	102 85	3	102 25	.....	286 00	.....	.....	96	05
Virginia	149	3,006 15	84 35	32	1,342 00	65	1,812 64	5 40	2,536 00	.....	25	2 48	76 05
Washington Territory	15	385 00	10 15	.....	140 00	5	144 43	.....	389 00	.....	.....	1 31	41
West Virginia	88	1,273 41	36 45	.....	511 00	22	667 35	18 25	1,127 00	.....	6 30	96	1 00
Wisconsin	827	14,957 45	417 05	9 02	28,044 93	1,123	31,082 24	108 50	11,631 85	.....	.....	64 04	541 82
Wyoming Territory	4	85 00	2 50	.....	19 44	1	20 05	.....	86 00	.....	.....	25	64
Total	19,454	420,722 12	11,662 80	196 78	222,679 73	11,613	310,108 26	1,421 29	295,335 18	42,512 67	316 15	1,377 50	4,190 38

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 16.—*Statement of the receipts and disbursements of the money-order office with the German Empire for the fractional year ended June* 30, 1873.

RECEIPTS.

Amount of orders issued	$420,722 12
Amount of fees received	11,662 80
Amount transferred from domestic fund	222,679 73
Balance due postmasters	196 78
	655,261 43

DISBURSEMENTS.

Amount of orders paid	$310,108 26
Amount of orders repaid	1,421 29
Amount transferred to domestic fund	295,335 18
Amount paid German Empire	42,512 67
Amount allowed for commissions and clerk-hire	1,377 50
Amount allowed for incidental expenses	316 15
Balance in hands of postmasters June 30, 1873	4,190 38
	655,261 43

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 17.—*Amount of letter-postage on British mails received in and sent from the United States during the fiscal year ended June* 30, 1873.

RECEIVED.

Lines.	Unpaid.	Unpaid distributed.	Paid.	Paid distributed.	Total.
Cunard line	$14,346 49	$18,430 83	.....	$146,992 61	$179,769 93
Dale, or Inman line	8,879 64	12,708 69	.....	97,882 82	119,471 15
North German Lloyd, of Bremen	6,733 53	10,461 91	.....	50,912 92	68,108 36
Canadian line	1 99	11	.....	126 98	129 08
White Star line	152 52	8 14	.....	280 34	441 00
Liverpool and Great Western Steam Company	20 74	16	.....	5 14	26 04
Transient steamers	101 36	5 16	.....	2 08	108 60
Total	30,236 27	41,615 00	.....	296,202 89	368,054 16
Amount received	71,851 27	.....	$296,202 89	.....	.....

SENT.

Lines.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Cunard line	.....	$13,800 38	.....	$503 42	$14,303 80
Dale, or Inman line	.....	27,311 12	.....	1,902 57	29,213 69
Liverpool and Great Western Steam Company	$538 30	162,689 67	.....	9,750 72	172,978 69
Hamburg-American Packet Company	.....	60,522 36	$1,147 73	5,455 22	67,125 31
Canadian line	.....	15,147 06	.....	556 16	15,703 22
White Star line	697 37	77,001 99	.....	4,277 31	81,976 67
North German Lloyd, of Bremen	886 98	18,830 23	.....	913 65	20,630 86
National line	.....	898 24	.....	46 64	944 88
Total	2,122 65	376,201 05	1,147 73	23,405 69	402,877 12
Amount sent	379,471 43	.....	.....	23,405 69	.....

Amount collected in the United States	$451,322 70
Amount collected in the United Kingdom	319,608 58
Total	770,931 28
Excess collected in the United States	131,714 12
Increase compared with last fiscal year	79,823 45

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 18.—*Amount of letter-postage on German Union mails received in and sent from the United States during the fiscal year ended June* 30, 1873.

RECEIVED.

Lines.	Unpaid.	Unpaid distributed.	Paid.	Paid distributed.	Total.
Cunard line, via England	$2,451 09	$16,506 68	.....	$12,102 83	$31,060 60
Dale line, via England	3,504 40	21,441 56	.....	13,290 13	38,236 09
North German Lloyd, of Bremen, via England	3,189 18	23,508 68	.....	15,183 66	41,881 52
Hamburg-American Packet Company, via France	1,681 33	9,844 34	.....	4,697 26	16,222 93
North German Lloyd, of Bremen, direct.	2,258 83	5,646 63	.....	40,453 24	48,358 70
Hamburg-American Packet Company, direct	2,984 42	8,415 51	.....	46,564 59	57,964 52
Baltic Lloyd, direct from Stettin	1 68	3 48	.....	9 62	14 78
Total	16,070 93	85,366 88	.....	132,301 33	233,739 14
Amount received	101,437 81	.....	$132,301 33	.....	.....

SENT.

Lines.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Cunard line, via England	.....	$518 54	.....	$3 08	$521 62
Dale line, via England	.....	5,923 19	.....	543 61	6,466 80
Liverpool and Great Western Steam Company, via England	$8 54	36,300 42	.....	5,350 50	41,659 46
North German Lloyd, of Bremen, via England	.....	20,650 29	.....	751 08	21,401 37
Hamburg-American Packet Company, via England	41 81	14,224 44	.....	629 01	14,895 26
White Star line, via England	17 14	314 21	.....	.....	331 35
North German Lloyd, of Bremen, direct.	18 42	60,138 17	.....	9,592 03	69,748 62
Hamburg-American Packet Company, direct	.....	78,584 43	$51 66	9,788 81	88,424 90
Baltic Lloyd, direct to Stettin	.....	7 38	.....	48	7 86
Total	85 91	216,661 07	51 66	26,658 60	243,457 24
Amount sent	216,798 64	.....	.....	26,658 60	.....

Amount collected in the United States	$318,236 45
Amount collected in the German Union	158,959 93
Total	477,196 38
Excess collected in the United States	159,276 52
Decrease compared with the last fiscal year	10,144 82

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 19.—*Amount of letter-postage collected on French mails received in and sent from the United States during the fiscal year ended June* 30, 1873.

RECEIVED.

Lines.	Unpaid distributed.	Unpaid.	Paid.	Paid distributed.	Total.
Hamburg-American Packet Company ...	$1,640 80	$2,148 80	.....	.....	$3,789 60
North German Lloyd, of Bremen	60 40	100 80	.....	.....	161 20
French Steamship Company	3,040 90	3,406 80	.....	.....	6,447 70
Baltic Lloyd.....	11 00	33 10	.....	.....	44 10
Total.....	4,753 10	5,689 50	.....	.....	10,442 60
Amount received.....	10,442 60	.....	.....	.....	.....

SENT.

Lines.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Hamburg-American Packet Company ...	.....	$4,117 30	$181 80	.....	$4,299 10
French Steamship Company.....	.....	2,600 70	.....	.....	2,600 70
Baltic Lloyd.....	.....	10	.....	.....	10
Total.....	.....	6,718 10	181 80	.....	6,899 90
Amount sent	$6,899 90	.....	.....	.....	.....

Amount collected in the United States.....	$17,342 50
Amount collected in France.....	Unknown.
Total collected in the United States	17,342 50
Decrease compared with last fiscal year.....	5,334 60

No postal convention in operation with France during the fiscal year.

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
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No. 20.—*Amount of letter-postage collected on Belgian mails received in and sent from the United States during the fiscal year ended June* 30, 1873.

RECEIVED.

Lines.	Unpaid.	Unpaid distributed.	Paid.	Paid distributed.	Total.
Cunard line	$136 67	$221 42	.....	$2,487 36	$2,845 45
Dale, or Inman line	125 34	155 75	.....	1,754 01	2,035 10
North German Lloyd, of Bremen	131 93	170 50	.....	1,730 50	2,032 93
Red Star line	.....	.....	.....	4 90	4 90
Total	393 94	547 67	.....	5,976 77	6,918 38
Amount received	941 61	.....	$5,976 77	.....	.....

SENT.

Lines.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Dale, or Inman Line	$503 18	.....	.....	$109 84	$613 02
Liverpool and Great Western Steam Company	2,582 07	.....	.....	525 01	3,107 08
Hamburg-American Packet Company	1,332 06	.....	.....	330 30	1,662 36
White Star line	30 30	.....	.....	.....	30 30
Cunard line	137 32	.....	.....	13 90	151 22
North German Lloyd, of Bremen	1,779 11	.....	.....	349 19	2,128 30
Red Star line	9 80	.....	.....	2 40	12 20
Total	6,373 84	.....	.....	1,330 64	7,704 48
Amount sent	6,373 84	.....	.....	1,330 64	.....

Amount collected in the United States	$7,315 45
Amount collected in Belgium	7,307 41
Total	14,622 85
Excess collected in the United States	8 04
Increase compared with last fiscal year	378 75

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 21.—*Amount of letter-postage on Netherlands mails received in and sent from the United States during the fiscal year ended June* 30, 1873.

RECEIVED.

Lines.	Unpaid distributed.	Unpaid.	Paid.	Paid distributed.	Total.
Cunard line	$692 85	$76 83	.....	$2,300 47	$3,070 15
Dale, or Inman line	1,209 73	93 51	.....	2,525 26	3,828 50
North German Lloyd, of Bremen	905 25	71 97	.....	2,161 04	3,138 26
Total	2,807 83	242 31	.....	6,986 77	10,036 91
Amount received	.....	3,050 14	.....	6,986 77	.....

SENT.

Lines.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Dale, or Inman line	.....	$1,067 60	.....	$105 48	$1,173 08
Liverpool and Great Western Steam Company	.....	4,235 70	.....	586 80	4,822 50
Cunard line	.....	52 40	.....	6 90	59 30
North German Lloyd, of Bremen	.....	2,600 80	.....	353 10	2,953 90
Hamburg-American Packet Company	.....	2,789 70	.....	277 00	3,066 70
Total	.....	10,746 20	.....	1,329 28	12,075 48
Amount sent	$10,746 20	.....	.....	1,329 28	.....

Amount collected in the United States	$13,796 34
Amount collected in the Netherlands	8,316 05
Total	22,112 39
Excess collected in the United States	5,480 29
Decrease compared with last fiscal year	673 72

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST OFFICE DEPARTMENT, *October* 20, 1873.

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No. 22.—*Amount of letter-postage collected on Switzerland mails received in and sent from the United States during the fiscal year ended June 30, 1873.*

RECEIVED.

Lines.	Unpaid.	Unpaid distributed.	Paid.	Paid distributed.	Total.
Cunard line, via England	$267 40	$1,436 70	.....	$5,297 02	$7,001 12
Dale, or Inman line, via England	188 15	1,382 10	.....	4,783 00	6,353 25
North German Lloyd, of Bremen, via England	179 65	887 35	.....	3,374 20	4,441 20
North German Lloyd, of Bremen, via direct service from Bremen	10 38	32 39	.....	610 24	653 51
Hamburg-American Packet Company, via direct service from Hamburg	8 66	32 03	.....	729 04	769 73
Total	654 24	3,771 07	.....	14,793 50	19,218 81
Amount received	4,425 31	.....	$14,793 50	.....	.....

SENT.

Lines.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Dale, or Inman line, via England	.....	$965 20	.....	$241 10	$1,206 30
Liverpool and Great Western Steam Company, via England	.....	5,618 20	.....	1,411 80	7,030 00
Cunard line, via England	.....	77 70	.....	18 50	96 20
North German Lloyd, of Bremen, via England	.....	3,524 50	.....	794 90	4,319 40
Hamburg line, via England	.....	2,945 40	.....	696 80	3,642 20
North German Lloyd, of Bremen, via direct service to Bremen	.....	611 30	.....	80 48	691 78
Hamburg-American Packet Company, via direct service to Hamburg	.....	640 60	.....	81 52	722 12
Total	.....	14,382 90	.....	3,325 10	17,708 00
Amount sent	$14,382 90	.....	.....	3,325 10	.....

Amount collected in the United States	$18,808 21
Amount collected in Switzerland	18,118 60
Total	36,926 81
Excess collected in the United States	689 61
Increase compared with last fiscal year	3,341 60

J. J. MARTIN, *Auditor.*

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No. 23.—*Amount of letter-postage collected on Italian mails received in and sent from the United States during the fiscal year ended June* 30, 1873.

RECEIVED.

Lines.	Unpaid.	Unpaid distributed.	Paid.	Paid distributed.	Total.
Cunard line	$654 58	$1,388 35	.....	$4,871 06	$6,913 99
Dale, or Inman line	713 25	1,178 00	.....	4,028 37	5,919 62
North German Lloyd, of Bremen	1,035 97	2,061 88	.....	6,165 59	9,263 44
Total	2,403 80	4,628 23	.....	15,065 02	22,097 05
Amount received	7,032 03	.....	$15,065 02	.....	.....

SENT.

Lines.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Dale, or Inman line	.....	$820 40	.....	$65 99	$886 39
Liverpool and Great Western Steam Company	.....	6,546 16	.....	584 49	7,130 65
Cunard line	.....	99 60	.....	6 49	106 09
North German Lloyd, of Bremen	.....	4,012 20	.....	347 27	4,359 47
Hamburg-American Packet Company	.....	2,576 89	.....	273 61	2,850 50
Total	.....	14,055 25	.....	1,277 85	15,333 10
Amount sent	$14,055 25	.....	.....	1,277 85	.....

Amount collected in the United States	$21,087 28
Amount collected in Italy	16,342 87
Total	37,430 15
Excess collected in the United States	4,744 41
Increase compared with last fiscal year	10,624 39

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 24.—*Amount of letter-postage collected on Danish mails received in and sent from the United States during the fiscal year ended June* 30, 1873.

RECEIVED.

Lines.	Unpaid.	Unpaid distributed.	Paid.	Paid distributed.	Total.
Hamburg-American Packet Company	$1,244 78	$4,576 65	.....	$6,598 29	$12,419 72
North German Lloyd, of Bremen	773 23	3,230 75	.....	4,535 38	8,539 36
Baltic Lloyd	37 69	131 82	.....	119 84	289 35
Total	2,055 70	7,939 22	.....	11,253 51	21,248 43
Amount received	9,994 92	.....	$11,253 51	.....	.....

SENT.

Lines.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Hamburg-American Packet Company	.....	$5,098 32	.....	$612 12	$5,710 44
North German Lloyd, of Bremen	.....	2,420 84	.....	435 98	2,856 82
Baltic Lloyd	.....	26	.....	.....	26
Total	.....	7,519 42	.....	1,048 10	8,567 52
Amount sent	$7,519 42	.....	.....	1,048 10	.....

Amount collected in the United States	$17,514 34
Amount collected in Denmark	12,301 61
Total	29,815 95
Excess collected in the United States	5,212 73
Convention with Denmark went into operation January 1, 1872. Total amount of postages for the six months ended June 30, 1872	5,074 36

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No. 25.—*Amount of letter-postage collected on Norwegian mails received in and sent from the United States during the fiscal year ended June* 30, 1873.

RECEIVED.

Line.	Unpaid.	Unpaid distributed.	Paid.	Paid distributed.	Total.
Baltic Lloyd	.....	.....	$40 98	.....	$40 98
Total	.....	.....	40 98	.....	.....
Amount received	.....	.....	40 98	.....	.....

SENT.

Line.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Baltic Lloyd	.....	$62 10	.....	.....	$62 10
Total	.....	62 10	.....	.....	62 10
Amount sent	.....	62 10	.....	.....	.....

Amount collected in the United States	$62 10
Amount collected in Norway	40 98
Total	103 08
Excess collected in the United States	21 12

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No. 26.—*Amount of letter-postage collected on Spanish mails sent from the United States during the fiscal year ended June* 30, 1873.

SENT.

Line.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Hamburg-American Packet Company	.....	$26 10	.....	.....	$26 10
Total	.....	26 10	.....	.....	26 10
Amount sent	$26 10	.....	.....	.....	.....

Amount collected in the United States $26 10

No account of the mails received has been reported to this office.

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No. 27.—*Amount of letter-postage collected on European mails received in and sent from the United States during the fiscal year ended June* 30, 1873.

RECEIVED.

Countries.	Unpaid.	Unpaid distributed.	Paid.	Paid distributed.	Total.
The United Kingdom	$30,236 27	$41,615 00	.....	$296,202 89	$368,054 16
The German Union	16,070 93	85,366 88	.....	132,301 33	233,739 14
France	4,753 10	5,689 50	.....	.....	10,442 60
Belgium	393 94	547 67	.....	5,976 77	6,918 38
Netherlands	242 31	2,807 83	.....	6,986 77	10,036 91
Switzerland	654 24	3,771 07	.....	14,793 50	19,218 81
Italy	2,403 80	4,628 23	.....	15,065 02	22,097 05
Denmark	2,055 70	7,939 22	.....	11,253 51	21,248 43
Norway	.....	.....	.....	40 98	40 98
Spain	.....	.....	.....	.....	.....
Total	56,810 29	152,365 40	.....	482,620 77	691,796 46
Amount received	209,175 69	.....	$482,620 77	.....	.....

SENT.

Countries.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
The United Kingdom	$2,122 65	$376,201 05	$1,147 73	$23,405 69	$402,877 12
The German Union	85 91	216,661 07	51 66	26,658 60	243,457 24
France	.....	6,718 10	181 80	.....	6,899 90
Belgium	.....	6,373 84	.....	1,330 64	7,704 48
Netherlands	.....	10,746 20	.....	1,329 28	12,075 48
Switzerland	.....	14,382 90	.....	3,325 10	17,708 00
Italy	.....	14,055 25	.....	1,277 85	15,333 10
Denmark	.....	7,519 42	.....	1,048 10	8,567 52
Norway	.....	62 10	.....	.....	62 10
Spain	.....	26 10	.....	.....	26 10
Total	2,208 56	652,746 03	1,381 19	58,375 26	714,711 04
Amount sent	656,335 78	.....	.....	58,375 26	.....

Amount collected in the United States	$865,511 47
Amount collected in European countries	540,996 03
Total	1,406,507 50
Excess collected in the United States	324,515 44
Increase compared with last fiscal year	102,653 45

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No. 28.—*Number and weight of letters and weight of newspapers, &c., exchanged between the United States and the United Kingdom in British mails during the fiscal year ended June* 30, 1873.

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Wt. in ozs.*	*Rates.*	*Wt. in ozs.*	*Lbs. Ozs.*	*Lbs. Ozs.*
Cunard line	2,784,952	891,069¼	212,332	64,472½	351,913 4¼	11,940 13¼
Dale, or Inman line	1,864,772	591,824½	439,996	145,034½	187,596 8¾	32,835 4½
Liverpool and Great Western Steam Company	285	93¾	2,664,791	867,309¾	.....	214,111 12¼
North German Lloyd, of Bremen	1,059,275	330,719	301,543	98,539¾	124,040 4¾	27,794 14
Canadian line	2,135	757½	253,577	80,570½	6 5½	20,957 7
White Star line	6,035	2,038½	1,229,885	403,687	32 12½	92,810 8
Hamburg-American Packet Company	.....	.....	996,878	325,251½	.....	75,137 10½
National line	.....	.....	15,564	5,113	.....	1,385 1½
Transient steamers	1,096	359¾	.....	.....	.....	.....
Total	5,718,550	1,816,862½	6,114,566	1,989,978½	663,589 4	476,973 7½
Increase compared with last fiscal year	530,765	163,112	545,533	163,291	64,832 12¾	37,991 8½

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No. 29.—*Number and weight of letters and weight of newspapers, &c., exchanged between the United States and the German Union (in closed mails through England and France, and by direct steamer) during the fiscal year ended June* 30, 1873.

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Grams.*	*Rates.*	*Grams.*	*Grams.*	*Grams.*
Cunard line, via England	284,621	2,648,087	6,967	65,746	1,770,685	67,695
Dale, or Inman line, via England	344,601	3,275,934	76,286	779,197	1,309,336	1,459,055
North German Lloyd, of Bremen, via England	371,310	3,524,111	280,287	2,712,508	2,422,123	3,963,414
Hamburg-American Packet Company, via England	.....	.....	195,254	1,864,039	.....	1,230,069
Liverpool and Great Western Steam Company, via England	.....	.....	515,225	4,910,187	.....	4,277,389
White Star line, via England	.....	.....	3,635	37,123	.....	.....
Hamburg-American Packet Company, via France	135,076	1,260,582	.....	.....	1,224,070	.....
North German Lloyd, of Bremen, direct	729,449	6,829,697	1,034,157	9,792,184	8,287,649	26,192,807
Hamburg-American Packet Company, direct	863,641	8,137,857	1,331,164	12,726,141	9,017,880	32,957,092
Baltic Lloyd, direct	195	1,837	128	1,241	305	152,736
Total	2,728,893	25,678,105	3,443,103	32,888,366	24,032,048	70,300,257
Increase compared with last fiscal year	226,686	2,140,634	297,438	3,206,448	3,814,672	6,140,908

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No. 30.—*Number and weight of letters and weight of newspapers, &c., exchanged between the United States and France during the fiscal year ended June* 30, 1873.

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Grams.*	*Rates.*	*Grams.*	*Grams.*	*Grams.*
Hamburg-American Packet Co..	37, 903	288, 683	42, 358	486, 020	26, 034	9, 324, 142
French Steamship Company	64, 457	498, 062	26, 007	261, 131	937, 276	2, 113, 616
North German Lloyd, of Bremen	1, 612	12, 309	.....	.....	1, 950	.....
Baltic Lloyd	441	3, 738	1	10	85	.....
Total	104, 413	802, 792	68, 366	747, 161	965, 345	11, 437, 758
Compared with last fiscal year. Increase..	10, 162	88, 137	.....	.....	205, 095	2, 316, 293
Compared with last fiscal year. Decrease .	.....	.....	64, 154	428, 026	.....	.....

These mails were sent to and received direct from France; no postal convention in operation during the fiscal year.

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No. 31.—*Number of rates and weight of letters and weight of printed matter exchanged between the United States and Belgium during the fiscal year ended June* 30, 1873.

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Grams.*	*Rates.*	*Grams.*	*Grams.*	*Grams.*
Cunard line	26, 224	229, 608	1, 484	14, 025	739, 103	49, 862
Dale, or Inman line	19, 114	165, 585	5, 755	54, 427	523, 249	173, 689
North German Lloyd, of Bremen.	19, 090	161, 139	20, 042	189, 769	670, 154	613, 926
Liverpool and Great Western Steam Company	.....	.....	29, 458	271, 465	.....	824, 175
Hamburg-American Packet Co..	.....	.....	15, 957	150, 441	.....	345, 938
White Star line	.....	.....	350	2, 391	.....	.....
Red Star line	49	528	122	1, 359	45	934
Total	64, 477	556, 860	73, 168	683, 877	1, 932, 551	2, 008, 524
Compared with last fiscal year. Increase..	1, 831	.....	824	15, 080	.....	.....
Compared with last fiscal year. Decrease .	.....	6, 157	.....	.....	75, 777	113, 876

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No. 32.—*Number of rates and weight of letters and weight of newspapers, &c., exchanged between the United States and the Netherlands during the fiscal year ended June* 30, 1873.

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Grams.*	*Rates.*	*Grams.*	*Grams.*	*Grams.*
Cunard line	27, 875	266, 872	593	5, 689	346, 748	15, 719
Dale, or Inman line	33, 962	298, 807	11, 732	132, 330	450, 836	167, 712
North German Lloyd, of Bremen	27, 977	253, 486	29, 539	294, 226	466, 084	668, 214
Liverpool and Great Western Steam Company	.....	.....	48, 229	487, 709	.....	749, 310
Hamburg-American Packet Co.	.....	.....	30, 667	330, 607	.....	277, 024
Total	89, 814	819, 165	120, 760	1, 250, 561	1, 263, 668	1, 877, 979
Compared with last fiscal year: Increase	11, 098	93, 295	.....	.....	150, 218	331, 325
Compared with last fiscal year: Decrease	.....	.....	18, 042	292, 590	.....	.....

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No. 33.—*Number of rates and weight of letters and weight of newspapers, &c., exchanged between the United States and Switzerland, in closed mails, via England and Belgium, and by direct steamer, via Bremen and Hamburg, during the fiscal year ended June* 30, 1873.

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Grams.*	*Rates.*	*Grams.*	*Grams.*	*Grams.*
Cunard line, via England	64, 496	526, 506	962	8, 629	822, 430	32, 616
Dale, or Inman, via England	58, 475	460, 322	12, 063	108, 433	479, 941	415, 588
Liverpool and Great Western Steam Company, via England	.....	.....	70, 300	614, 649	.....	1, 633; 876
North German Lloyd, of Bremen, via England	40, 977	326, 065	43, 194	390, 071	662, 729	1, 318, 671
Hamburg-American Packet Co., via England	.....	.....	36, 422	293, 946	.....	750, 747
North German Lloyd, of Bremen, via Bremen	7, 962	66, 358	9, 259	77, 355	553, 761	625, 640
Hamburg-American Packet Co., via Hamburg	9, 431	99, 520	9, 014	85, 218	639, 960	770, 854
Total	181, 341	1, 478, 771	181, 214	1, 578, 301	3, 158, 821	5, 547, 992
Increase compared with last fiscal year	25, 359	221, 954	16, 192	100, 382	1, 016, 377	503, 237

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No. 34.—*Number of rates and weight of letters and weight of newspapers, &c., exchanged between the United States and Italy during the fiscal year ended June* 30, 1873.

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Grams.*	*Rates.*	*Grams.*	*Grams.*	*Grams.*
Cunard line	58, 321	444, 251	1, 055	9, 465	598, 155	.....
Dale, or Inman line	49, 390	384, 690	8, 814	75, 828	597, 838	257, 036
North German Lloyd, of Bremen.	76, 273	575, 469	43, 336	359, 259	851, 359	1, 174, 867
Liverpool and Great Western Steam Company	.....	.....	71, 617	604, 338	.....	1, 663, 117
Hamburg-American Packet Co.	.....	.....	28, 256	258, 187	.....	738, 701
Total	183, 984	1, 404, 410	153, 078	1, 307, 077	2, 047, 352	3, 833, 721
Increase compared with last fiscal year	43, 996	348, 363	42, 378	382, 433	453, 079	540, 210

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No. 35.—*Number of rates and weight of letters and weight of newspapers, &c., exchanged between the United States and Denmark during the fiscal year ended June* 30, 1873.

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Grams.*	*Rates.*	*Grams.*	*Grams.*	*Grams.*
Hamburg-American Packet Co.	139, 373	1, 142, 709	79, 135	731, 184	713, 296	401, 133
North German Lloyd, of Bremen.	97, 285	803, 256	39, 022	351, 481	550, 241	149, 533
Baltic Lloyd	2, 990	23, 601	3	28	12, 879	4, 501
Total	239, 648	1, 969, 566	118, 160	1, 082, 693	1, 276, 416	555, 167
Number exchanged for the six months ended June 30, 1872	47, 010	412, 940	15, 571	145, 014	372, 345	234, 583

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No. 36.—*Number of rates and weight of letters and weight of newspapers, &c., exchanged between the United States and Norway and Sweden, during the fiscal year ended June* 30, 1873.

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Grams.*	*Rates.*	*Grams.*	*Grams.*	*Grams.*
Norwegian steamers	683	6,800	.....	.....	6,075	67,244
Baltic-Lloyd	.....	.....	1,035	9,994	.....	20,504
Total	683	6,800	1,035	9,994	6,075	87,748
Compared with last fiscal year { Increase	395	3,974	.....	.....	Not stated last year.	11,398
Compared with last fiscal year { Decrease	.....	.....	1,836	18,751		.....

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No. 37.—*Number of rates and weight of letters sent from the United States to Spain during the fiscal year ended June* 30, 1873.

Line.	Letters sent.	
	Rates.	*Grams.*
Hamburg American Packet Company	261	2,088
Decrease compared with last fiscal year	13	704

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No. 38.—*Statement of letters and newspapers, with the several postages, received in and sent from the United States to Panama and Colon during the fiscal year ended June* 30, 1873.

Pacific Mail Steamship Company.	Letters.	Newspapers, &c.	Postage on letters.
Received	116,990	61,556	$12,870 42
Sent	110,506	151,892	17,124 94
Total	227,496	213,448	29,995 36
Add newspaper postages, at two cents each	.....	.....	4,268 96
Total postages	.....	.....	34,264 32
Increase compared with last fiscal year	31,729	17,279	3,873 13

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No. 39.—*Statement of letters and newspapers, with the several postages, received in and sent from the United States to Mexico during the fiscal year ended June* 30, 1873.

United States and Mexican Steamship Company.		Letters.	Newspapers, &c.	Postage on letters.
Received		17,048	17,687	$516 13
Sent		26,130	32,222	2,625 20
Total		43,178	49,909	3,141 33
Add newspaper postages, at two cents each		.....	.....	998 18
Total postages		.....	.....	4,139 51
Compared with last fiscal year	Increase	1,034	.....	.....
	Decrease	.....	6,902	14 32

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No. 40.—*Statement of letters and newspapers, with the several postages, received in and sent from the United States to Brazil during the fiscal year ended June* 30, 1873.

United States and Brazil Steamship Company.		Letters.	Newspapers, &c.	Postage on letters.
Received		37,027	30,640	$2,032 33
Sent		52,429	58,354	8,444 63
Total		89,456	88,994	10,476 96
Add newspaper postages, at two cents each		.....	.....	1,779 88
Total postages		.....	.....	12,256 84
Compared with last fiscal year	Increase	147	.....	707 90
	Decrease	.....	9,177	.....

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No. 41.—*Statement of letters, with the several postages, received in and sent from the United States to Belize, Honduras, during the fiscal year ended June* 30, 1873.

New Orleans and Honduras Steamship Company.	Letters.	Newspapers, &c.	Postage on letters.
Received	No report...	No report...	.....
Sent	299	....do.....	$32 68
Total	299	.....	32 68
Decrease compared with last fiscal year	1,827	.....	227 62

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No. 42.—*Statement of letters and newspapers, with the several postages, received in and sent from the United States to Ecuador during the fiscal year ended June* 30, 1873.

Pacific Mail Steamship Company.	Letters.	Newspapers, &c.	Postage on letters.
Received	1,687	290	$337 40
Sent	4,066	6,687	801 00
Total	5,753	6,977	1,138 40
Add newspaper postages, at two cents each			139 54
Total postages			1,277 94
Increase compared with last fiscal year	3,644	2,686	774 32

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No. 43.—*Statement of letters and newspapers, with the several postages, received in the United States from Venezuela during the fiscal year ended June* 30, 1873.

Pim, Forwood & Co.'s line.	Letters.	Newspapers, &c.	Postage on letters.
Received	1,002	102	$100 20
Add newspaper postages, at two cents each			2 04
Total postages			102 24

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No. 44.—*Statement of letters and newspapers, with the several postages, received in and sent from the United States to New Granada during the fiscal year ended June* 30, 1873.

Pim, Forwood & Co.'s line.	Letters.	Newspapers, &c.	Postage on letters.
Received	3,582	425	$358 20
Sent	3,311	1,536	331 10
Total	6,893	1,961	689 30
Add newspaper postages, at two cents each			39 22
Total postages			728 52

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No. 45.—*Statement of letters and newspapers, with the several postages, received in and sent from the United States to the West India Islands during the fiscal year ended June* 30, 1873.

West India mail-steamers.		Letters.	Newspapers, &c.	Postage on letters.
Received		493,427	132,915	$52,954 42
Sent		344,779	186,789	37,643 97
Total		838,206	318,704	90,598 39
Add newspaper postages, at two cents each		.....	.....	6,374 08
Total postages		.....	.....	96,972 47
Compared with last fiscal year	Increase	22,983	.....	2,332 48
	Decrease	.....	14,553	.....

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No. 46.—*Statement of letters and newspapers, with the several postages, received in and sent from the United States to China and Japan during the fiscal year ended June* 30, 1873.

Pacific Mail Steamship Company.	Letters.	Newspapers, &c.	Postage on letters.
Received	124,466	115,818	$13,395 60
Sent	92,059	156,598	9,425 90
Total	216,525	272,416	22,821 50
Add newspaper postages, at two cents each	.....	.....	5,448 32
Total postages	.....	.....	28,269 82
Increase compared with last fiscal year, as reported	165,828	204,650	21,940 20

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No. 47.—*Statement of letters and newspapers, with the several postages, received in and sent from the United States to Honolulu, Auckland, Melbourne, Sydney, &c., during the fisca year ended June* 30, 1873.

California, Oregon and Mexico Steamship Company.	Letters.	Newspapers, &c.	Postage on letters.
Received	41,911	46,343	$2,459 64
Sent	43,798	97,771	3,960 80
Total	85,709	144,114	6,420 44
Add newspaper postages, at two cents each	.....	.....	2,882 28
Total postages	.....	.....	9,302 72
Increase compared with last fiscal year	42,321	75,313	4,752 76

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No. 48.—*Statement of the amount of letter postages on the mails exchanged between the United States and Nova Scotia, Newfoundland, and Bermuda, (by mail steamers,) with partial report of the number of letters and newspapers, during the fiscal year ended June* 30, 1873.

	Unpaid.	Unpaid distributed.	Paid distributed.	Number of letters.*	Number of newspapers, &c.*
Received	$817 30	$986 35	$5 70	14,895	3,406
Sent			5,442 43	5,734	6,754

* Reported by New York office only.

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY,
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 49.—*Amount of postages on mails exchanged between the United States and the British Provinces during the fiscal year ended June* 30, 1873.

Amount on unpaid received	$19,357 51	
Amount on paid received	179,253 30	$193,610 81
Amount on unpaid sent	26,082 73	
Amount on paid sent	202,762 76	228,845 49
Total		427,456 30
Amount collected in the United States		$222,120 27
Amount collected in the British Provinces		205,336 03
Excess collected in the United States		16,784 24
Increase compared with last fiscal year		$37,578 72
Number of letters sent		$3,375,852
Number of letters received		2,962,673
Number of newspapers sent		1,134,330
Number of newspapers received		523,664

NOTE.—Several of the larger offices have failed to report the number of newspapers exchanged.

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY,
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 50.—*Number of letters exchanged between the United States and foreign countries during the fiscal year ended June* 30, 1873.

Countries.	Number of letters.	
	Received.	Sent.
United Kingdom of Great Britain and Ireland	5,718,550	6,114,566
German Union	2,728,893	3,443,103
France	104,413	68,366
Belgium	64,477	73,168
Netherlands	89,814	120,760
Switzerland	181,341	181,214
Italy	183,984	153,078
Denmark	239,648	118,160
Norway and Sweden	683	1,035
Spain	.....	261
Panama	116,990	110,506
Mexico	17,048	26,130
Brazil	37,027	52,429
Honduras	.....	299
Ecuador	1,687	4,066
Venezuela	1,002	.....
New Granada	3,582	3,311
West India Islands	493,427	344,779
China and Japan	124,466	92,059
Honolulu, &c	41,911	43,798
Nova Scotia, Newfoundland, and Bermuda*	14,895	5,734
Canadian provinces	2,962,673	3,375,852
Total	13,126,511	14,332,674
Increase compared with last fiscal year	1,608,598	1,676,998

* Partial returns only.

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 51.—*Amounts reported as due the steamers of the Dale or Inman line for services rendered during the fiscal year ended June* 30, 1873.

Third quarter of 1872	$11,790 40
Fourth quarter of 1872	195 00
Second quarter of 1873	508 62
Total amount paid	12,494 02

Amounts reported as due the steamers of the North German Lloyd, of Bremen, for services rendered during the fiscal year ended June 30, 1873.

Third quarter of 1872	$7,620 12
Fourth quarter of 1872	8,314 46
First quarter of 1873	7,813 39
Second quarter of 1873	9,806 97
Total amount paid	33,554 94

Amounts reported as due the steamers of the Canadian line for services rendered during the fiscal year ended June 30, 1873.

Third quarter of 1872	$1,696 36
Fourth quarter of 1872	961 77
First quarter of 1873	1,711 69
Second quarter of 1873	1,695 31
Total amount paid	6,065 13

Amounts reported as due the steamers of the Hamburg-American Packet Company for services rendered during the fiscal year ended June 30, 1873.

Third quarter of 1872	$10,524 27
Fourth quarter of 1872	14,520 20
First quarter of 1873	17,458 67
Second quarter of 1873	14,116 40
Total amount paid	56,619 54

Amounts reported as due the steamers of the Cunard line for services rendered during the fiscal year ended June 30, 1873.

Third quarter of 1872	$1,517 04
Fourth quarter of 1872	704 30
First quarter of 1873	546 06
Second quarter of 1873	1,975 25
Total amount paid	4,742 65

Amounts reported as due the steamers of the Liverpool and Great Western Steam Company for services rendered during the fiscal year ended June 30, 1873.

Third quarter of 1872	$17,861 57
Fourth quarter of 1872	18,085 35
First quarter of 1873	18,824 56
Second quarter of 1873	19,825 94
Total amount paid	74,597 42

Amount reported as due the steamers of the Baltic-Lloyd for services rendered during the fiscal year ended June 30, 1873.

Third quarter of 1872	$12 07

Amounts reported as due the steamers of the White Star line for services rendered during the fiscal year ended June 30, 1873.

Third quarter of 1872	No service.
Fourth quarter of 1872	$10,095 23
First quarter of 1873	11,643 42
Second quarter of 1873	8,093 32
Total amount paid	29,831 97

Amount reported as due the steamers of the National line for services rendered during the fiscal year ended June 30, 1873.

Second quarter of 1873	$390 49

Amounts reported as due the steamers of the Pacific Mail Steamship Company for the conveyance of mails between the United States and Panama during the fiscal year ended June 30, 1873.

Third quarter of 1872	$7,556 18
Fourth quarter of 1872	5,970 83
First quarter of 1873	7,394 93
Second quarter of 1873	6,809 62
Total amount paid	27,731 56

Amounts reported as due the steamers conveying the mails between the United States and the West India Islands, Mexico, Brazil, Bermuda, New Granada, and New Zealand, for services rendered during the fiscal year ended June 30, 1873.

Third quarter of 1872	$14,485 59
Fourth quarter of 1872	19,643 39
First quarter of 1873	16,026 21
Second quarter of 1873	14,990 75
Total amount paid	65,145 94

Amounts reported as due the steamers conveying the mails between the United States and Nova Scotia for services rendered during the fiscal year ended June 30, 1873.

Third quarter of 1872	$1,014 30
Fourth quarter of 1872	599 18
First quarter of 1873	415 72
Second quarter of 1873	618 88
Total amount paid	2,648 08

The following reports for the transportation of closed mail, for the periods named, have been made during the fiscal year ended June 30, 1873:

To the steamers of the North German Lloyd of Bremen:

Third quarter of 1872	$18 80

To the steamers of the Liverpool and Great Western Steam Company:

First quarter of 1872	$1,732 08
Second quarter of 1872	1,331 05
Third quarter of 1872	1,632 87
Total	4,697 00

To the steamers of the Cunard Line:

First quarter of 1872	$2 02
Third quarter of 1872	232 70
Total	234 72

To the steamers of the Dale or Inman Line:

First quarter of 1872	$775 39
Second quarter of 1872	100 79
Third quarter of 1872	1,271 50
Total	2,147,68

To the steamers of the Hamburg-American Packet Company:

First quarter of 1872	$63 38
Second quarter of 1872	1,274 60
Third quarter of 1872	1 36
Total	1,339 34

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

No. 52.—*Balance due the United States on the adjustment of the postal accounts between the United States and Switzerland, for the quarters indicated, settlements made during the fiscal year ended June* 30, 1873.

Third quarter of 1872	$3,401 64
Fourth quarter of 1872	2,084 94
First quarter of 1873	1,896 93
Second quarter of 1873	1,996 00
Total	9,379 51

Balance due the United States on the adjustment of the postal accounts between the United States and the Netherlands, for the quarters indicated, settlements made during the fiscal year ended June 30, 1873.

Second quarter of 1872	$678 04
Third quarter of 1872	587 10
Fourth quarter of 1872	1,032 31
First quarter of 1873	866 40
Second quarter of 1873	972 71
Total	4,136 56

Balances due the United States on the adjustment of the postal accounts between the United States and Italy, for the quarters indicated, settlements made during the fiscal year ended June 30, 1873.

First quarter of 1872	$1,523 82
Second quarter of 1872	1,037 05
Third quarter of 1872	507 50
Fourth quarter of 1872	1,184 76
First quarter of 1873	2,277 76
Second quarter of 1873	1,600 89
Total	8,131 78

Balances due from the United States to the kingdom of Belgium on the adjustment of the postal accounts between the United States and Belgium, for the quarters indicated, settlements made during the fiscal year ended June 30, 1873.

First quarter of 1872	$2,038 96
Second quarter of 1872	1,917 38
Third quarter of 1872	1,974 55
Fourth quarter of 1872	1,937 35
First quarter of 1873	2,339 02
Total	10,207 26

Balances due from the United States to the German Union on the adjustment of the postal accounts between the United States and the German Union, for the quarters indicated, settlements made during the fiscal year ended June 30, 1873.

Fourth quarter of 1871	$27,205 67
First quarter of 1872	33,374 23
Second quarter of 1872	27,684 66
Third quarter of 1872	25,268 33
Fourth quarter of 1872	27,283 62
First quarter of 1873	33,056 24
Total	173,872 75

Balances due from the United States to the United Kingdom of Great Britain and Ireland on the adjustment of the postal accounts between the United States and the United Kingdom, for the quarters indicated, settlements made during the fiscal year ended June 30, 1873.

First quarter of 1872	$16,559 71
Second quarter of 1872	14,232 12
Third quarter of 1872	13,783 05
Total	44,574 88

Balances due on the adjustment of the extranational postal accounts between the United States and Denmark, for the quarters indicated, settlements made during the fiscal year ended June 30, 1873.

First quarter of 1872, balance due the United States	$5 94
Second quarter of 1872, balance due Denmark	$417 99
Third quarter of 1872, balance due Denmark	707 90
Fourth quarter of 1872, balance due Denmark	787 69
First quarter of 1873, balance due Denmark	1,086 94
Total due Denmark on the four quarters	3,000 52

J. J. MARTIN, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 20, 1873.

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